C21.5:945/4

Vol. 945 Number 4

OFFICIAL GAZETTE

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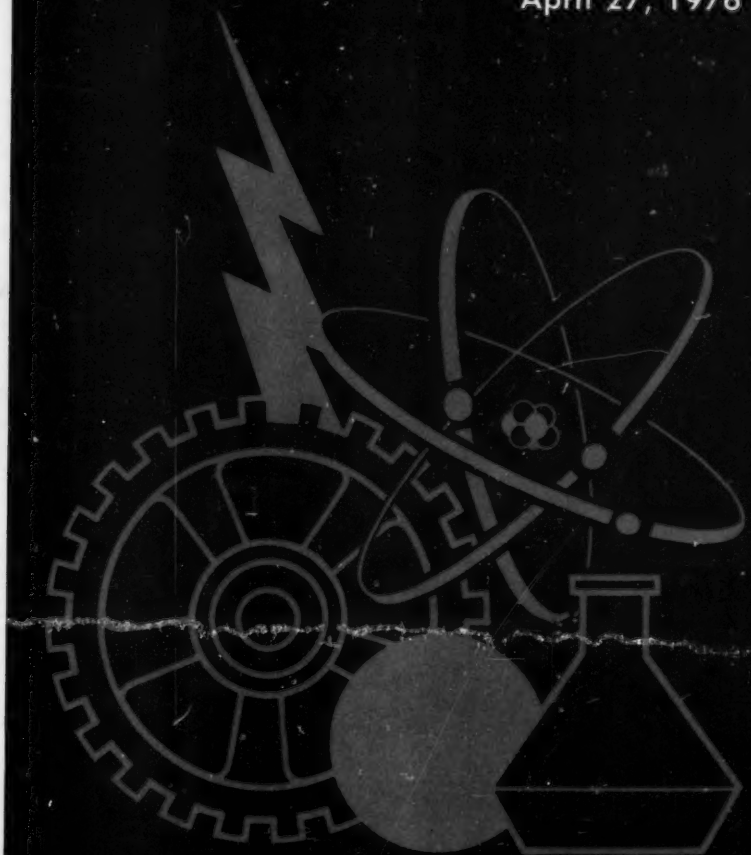
April 27, 1976



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OFFICIAL GAZETTE of the
UNITED STATES PATENT and TRADEMARK OFFICE

April 27, 1976 Volume 945 Number 4

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PATENT NOTICES

Certificates of Correction for the Week of April 27, 1976

R. 28,704	3,889,254	3,918,501	3,931,084
D. 238,302	3,889,277	3,818,799	3,931,411
D. 238,318	3,890,056	3,918,896	3,931,436
D. 238,429	3,890,137	3,918,936	3,931,615
3,489,786	3,890,747	3,918,959	3,931,705
3,508,911	3,891,209	3,919,620	3,931,778
3,605,593	3,891,281	3,919,752	3,932,133
3,640,911	3,893,163	3,919,809	3,932,171
3,645,723	3,894,676	3,920,740	3,932,493
3,663,649	3,896,077	3,920,928	3,932,512
3,703,489	3,896,465	3,921,175	3,932,644
3,713,822	3,898,219	3,921,408	3,932,907
3,754,912	3,900,010	3,921,434	3,933,116
3,760,578	3,900,715	3,921,591	3,933,781
3,782,153	3,900,737	3,921,640	3,933,837
3,789,069	3,901,097	3,921,656	3,933,918
3,807,006	3,901,311	3,922,891	3,934,178
3,810,695	3,901,861	3,922,932	3,934,258
3,810,772	3,901,985	3,923,084	3,934,275
3,815,179	3,902,954	3,923,172	3,934,427
3,816,253	3,903,338	3,923,361	3,934,494
3,818,799	3,904,325	3,923,475	3,934,576
3,820,109	3,904,963	3,923,483	3,934,587
3,824,000	3,904,992	3,923,621	3,934,702
3,826,153	3,905,543	3,924,094	3,935,062
3,830,039	3,905,950	3,925,036	3,935,108
3,833,534	3,906,907	3,925,162	3,935,307
3,837,524	3,908,010	3,925,325	3,935,314
3,839,341	3,908,412	3,925,795	3,935,330
3,839,342	3,909,619	3,926,402	3,935,451
3,841,888	3,910,585	3,926,622	3,935,502
3,842,618	3,911,361	3,926,669	3,935,529
3,845,135	3,911,655	3,927,251	3,935,713
3,845,413	3,912,696	3,927,413	3,935,803
3,849,043	3,913,137	3,927,600	3,936,121
3,849,150	3,913,664	3,927,802	3,936,593
3,849,824	3,913,838	3,927,954	3,937,170
3,856,547	3,913,990	3,927,986	3,937,308
3,858,071	3,914,201	3,928,316	3,937,453
3,859,364	3,914,207	3,928,364	3,937,502
3,862,871	3,914,225	3,928,845	3,937,577
3,865,231	3,914,909	3,929,148	3,937,708
3,867,423	3,915,050	3,929,218	3,937,776
3,867,529	3,915,090	3,929,473	3,937,789
3,867,900	3,915,284	3,929,765	3,938,353
3,873,445	3,915,924	3,929,999	3,938,417
3,874,479	3,916,218	3,930,135	3,938,631
3,875,228	3,916,383	3,930,138	3,938,762
3,875,433	3,916,647	3,930,425	3,938,910
3,881,652	3,916,845	3,930,497	3,939,300
3,884,146	3,917,041	3,930,616	3,939,591
3,886,034	3,917,230	3,930,767	3,940,739
3,886,999	3,917,353	3,930,820	
3,887,357	3,918,050	3,930,834	

Disclaimer and Dedication

3,904,059.—*David Bellamy, Jr.*, Kenilworth, and *James L. Gould*, Springfield, Ill. STERILE CLOSURE FOR SOLUTION BOTTLES. Patent dated Sept. 9, 1975. Disclaimer and dedication filed Mar. 8, 1976, by the assignee, *Baxter Laboratories, Inc.*

Hereby disclaims and dedicates to the Public claims 1 and 3 of said patent.

Dedications

Design No. 228,051.—*Calvin Masaru Shimaoka*, Harbor City, and *Anton A. Sixt*, Laguna Hills, Calif. STUDY CARREL. Patent dated Aug. 7, 1973. Dedication filed Mar. 1, 1976, by the assignee, *Carter Industries, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Design No. 229,048.—*Alexander I. Newman*, River Forest, Ill. MULTI-BLOCK-TYPE TEST TUBE HEATER. Patent dated Nov. 6, 1973. Dedication filed Mar. 18, 1976 by the assignee, *Lab-Line Instruments, Inc.*

Hereby enters this disclaimer to the claim of said patent.

2,876,413.—*Dean F. Saurenman* and *Maurice P. Lebourg*, Houston, Tex. BOREHOLE APPARATUS. Patent dated Mar. 3, 1959. Dedication filed Feb. 23, 1976, by the assignee, *Schlumberger Technology Corporation.*

Hereby dedicates to the Public the remainder of the term of said patent.

3,684,993.—*Hazen Curtis III*, Andover, and *Gerd Achim Tuchen*, Boxford, Mass. VARIABLE INDUCTANCE COIL FORM ASSEMBLY. Patent dated Aug. 15, 1972. Dedication filed Mar. 11, 1976, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,802,099.—*Leonard E. Mell*, Orange, *Loran A. Norton*, Santa Ana, and *David Keith Crosser*, Placentia, Calif. METHOD AND APPARATUS FOR TRAINING POLICEMEN. Patent dated Apr. 9, 1974. Dedication filed Mar. 1, 1976, by the assignee, *Carter Industries, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,812,532.—*David Keith Crosser*, Placentia, *Leonard E. Mell*, Orange, and *John F. Reuvers*, Santa Ana, Calif. RANDOM ACCESS MEMORY WITH TAPE RETURN TO A MIDTAPE REFERENCE POSITION AFTER READING. Patent dated May 21, 1974. Dedication filed Mar. 1, 1976, by the assignee, *Carter Industries, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

Disclaimers

Re. 27,798.—*Rein Raymond Laane*, Wheaton, Ill. ELECTRICAL COMMUNICATION SWITCHING NETWORK. Patent dated Oct. 30, 1973. Disclaimer filed Apr. 5, 1974, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1 through 16 and 18 through 20 of said patent.

3,119,549.—*Walter A. Schoen*, Milwaukee, Wis. RECLOSABLE COMMODITY BAG. Patent dated Jan. 28, 1964. Disclaimer filed Feb. 27, 1976, by the assignee, *Milprint, Inc.*

Hereby enters this disclaimer to claims 1 through 4, inclusive, of said patent.

3,475,926.—*Jakob E. Ruckstuhl*, Zurich, Switzerland. RAISED WARP KNIT FABRICS. Patent dated Nov. 4, 1969. Disclaimer filed Feb. 26, 1976, by the assignee, *Terlinden & Company.*

The term of this patent subsequent to May 21, 1930, has been disclaimed.

3,564,912.—*James T. Malone*, Arnold, Md., and *Donald K. Whirlow*, Murrysville, Pa. FLUID FLOW MEASUREMENT SYSTEM. Patent dated Feb. 23, 1971. Disclaimer filed Feb. 17, 1976, by the assignee, *Westinghouse Electric Corporation.*

Hereby enters this disclaimer to claims 1 to 4 of said patent.

3,594,047. *Richard A. Pucher* and *James Gordon Greiner*, Leola, Pa. FEED MATERIAL HANDLING APPARATUS. Patent dated July 20, 1971. Disclaimer filed Nov. 28, 1975, by the assignee, *Sperry Rand Corporation*.

Hereby enters this disclaimer to claims 1–19 of said patent.

3,666,609. *Frank Kalwaites*, Somerville, and *Peter L. Doviak*, South Brunswick, N.J. RETICULATE SHEET MATERIAL. Patent dated May 30, 1972. Disclaimer filed Feb. 11, 1976, by the assignee, *Johnson & Johnson*.

Hereby enters this disclaimer to claims 1–5, inclusive, and claims 9–12, inclusive, of said patent.

3,727,475.—*William W. Stell*, Wauwatosa, Wis. PULLEY-AND-SHAFT ASSEMBLY FOR ROTARY LAWN MOWERS AND METHOD OF MANUFACTURING THE SAME. Patent dated Apr. 17, 1973. Disclaimer filed Feb. 25, 1976, by the assignee, *Production Stamping Corporation*.

Hereby enters this disclaimer to claims 1 and 5 of said patent.

3,749,859.—*Richard C. Webb* and *James R. Webb*, Boulder, and *Tommy N. Tyler*, Broomfield, Colo. KEYBOARD SWITCH ASSEMBLY WITH IMPROVED HERMETICALLY SEALED DIAPHRAGM CONTACT STRUCTURE. Patent dated July 31, 1973. Disclaimer filed Jan. 13, 1976, by the assignee, *Mohawk Data Sciences Corp.*

Hereby enters this disclaimer to claim 1 of said patent.

3,815,288.—*Harold R. Wilson*, Wilmington, N.C. PATTERN MACHINING SYSTEM FOR DIE ROLLS. Patent dated June 11, 1974. Disclaimer filed Mar. 8, 1976, by the assignee, *General Electric Company*.

Hereby enters this disclaimer to claims 1, 4, 5, 6, 7, 8, 9, 17, 19, 20, 21, 22, 23, 24, 25, 26, 27, and 28 of said patent.

3,824,741.—*Harold R. Wilson*, Wilmington, N.C. METHOD AND APPARATUS FOR TRAVERSING A CAM FOLLOWER. Patent dated July 23, 1974. Disclaimer filed Mar. 8, 1976, by the assignee, *General Electric Company*.

Hereby enters the disclaimer to claim 4 of said patent.

3,865,818.—*John Krapcho*, Somerset, and *Chester F. Turk*, Elizabeth, N.J. SUBSTITUTED BENZOXAZINES. Patent dated Feb. 11, 1975. Disclaimer filed Mar. 8, 1976, by the assignee, *E. R. Squibb & Sons, Inc.*

Hereby enters this disclaimer to claims 1 to 13 of said patent.

3,898,643.—*Adrian B. Ettlinger*, Westchester, N.Y. ELECTRONIC DISPLAY CONTROLLED STAGE LIGHTING SYSTEM. Patent dated Aug. 5, 1975. Disclaimer filed Jan. 29, 1976, by the assignee, *Skirpan Lighting Control Corporation*.

Hereby enters this disclaimer to claims 2, 3 and 4 of said patent.

3,937,321.—*Thomas James Delaney*, Piscataway, and *William Grant Pierson*, Flanders, N.J. TOOTHPASTE. Patent dated Feb. 10, 1976. Disclaimer filed Feb. 17, 1976, by the assignee, *Colgate-Palmolive Company*.

The term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

3,937,803.—*Thomas James Delaney*, Piscataway, and *William Grant Pierson*, Flanders, N.J. FLAVORED DENTAL CREAMS. Patent dated Feb. 10, 1976. Disclaimer filed Feb. 17, 1976, by the assignee, *Colgate-Palmolive Company*.

The term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 10, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	5-15-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-8-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-14-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating: Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-5-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-5-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	2-27-75
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-16-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-22-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	10-10-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-19-75
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-10-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-19-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-13-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	5-15-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-30-75

Expiration of patents: The patents within the range of numbers indicated below expire during April 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,880,419 to 2,884,633 inclusive
Plant Patents..... Numbers 1,825 to 1,828 inclusive

REISSUES

APRIL 27, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

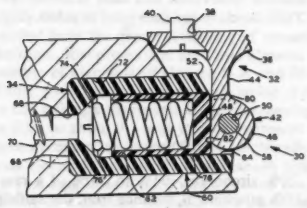
Re. 28,786
HINGE FOR LATCHLESS DOOR

Robert D. MacDonald, Grand Blanc, Mich., assignor to Cardinal of Adrian, Inc., Dryden, Mich.

Original No. 3,212,124, dated Oct. 19, 1965, Ser. No. 405,016, Oct. 12, 1964. Continuation of Ser. No. 203,944, June 20, 1962, abandoned. Application for reissue May 13, 1975, Ser. No. 575,774

Int. Cl.² E05D *11/08*

U.S. Cl. 16—141 6 Claims



4. A hinge to pivotally connect a door to a frame in a manner such that the door will close tightly without a latch, said hinge comprising a first portion and a second portion, said first portion having a first flange, a first ear, and a connection between said flange and said ear, one of said portions being attachable to the frame and the other portion being attachable to the door, *said connection between said first flange and said first ear being of sufficient length to space the hinged end of the door from the frame in the closed position of the door when the door has been pivotally connected to the frame*, said first portion being attachable along any part of said frame or said door, said second portion including a second flange, a second ear on one side of said second flange connected to said second flange, said first ear and said second ear being pivotally connected by a hinge pin, guide means extending from said second flange, a [pressure member] *plunger* carried by said second portion and guided with the aid of said guide means in a direction toward and away from said hinge pin, spring means carried by said second portion urging said [pressure member] *plunger* toward said hinge pin, said ear of said first portion having an arcuate portion and an engageable edge to be engaged by said [pressure member] *plunger*, said edge being positioned so that the force of said spring means acting through said [pressure member] *plunger* and said edge can be directed to one side of said hinge pin to produce a torque tending to move the door beyond its closed position, when the door is closed, and said arcuate portion being [positioned so that] *continuous from one end thereof at its juncture with said edge to its other end and being of sufficient length to have portions thereof receive* the force of said spring means acting through said [pressure member can be] *plunger against said arcuate portion and* directed through said hinge pin when said door is in any open position *between the near-closed position and the fully open position* and said [pressure member] *plunger* is spaced from said edge.

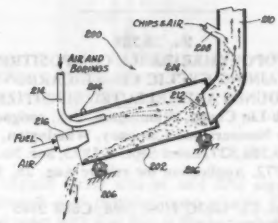
Re. 28,787
METHOD AND SYSTEM FOR HOT DE-OILING AND HOT BRIQUETTING

James E. Moore, Glenview, Ill., assignor to K-G Industries, Inc., Rosemont, Ill.

Original No. 3,564,699, dated Feb. 23, 1971, Ser. No. 886,337, Dec. 18, 1969. Division of Ser. No. 721,474, April 15, 1968, Pat. No. 3,497,190. Application for reissue Feb. 21, 1973, Ser. No. 334,283

Int. Cl.² B23Q *17/00*; F27B *7/14*

U.S. Cl. 29—403 10 Claims



1. In a system for heating material formed of a mass of small, individual metallic pieces carrying foreign substances at least part of which are combustible whereby the burning of said substances assists in the heating of the material, and for forming the hot metallic pieces into briquets, the improvement comprising a furnace construction for heating the material, said furnace construction including a combustion zone, at least one inlet opening adjacent the combustion zone, means for feeding a portion of said material carrying said substances through said inlet opening for movement of the material directly into the combustion zone, a second inlet opening located in an upstream position relative to said first inlet opening, and means for feeding a separate portion of said material into said second inlet opening, a first outlet defined by the furnace, means for moving the material fed through said inlet openings across said combustion zone towards said first outlet with the material fed through said second inlet moving past said first inlet, and a second outlet defined by said furnace upstream of said second inlet opening, the gases resulting from said combustion passing out through the material fed through said second inlet opening and out of said furnace through said second outlet, and wherein hot pieces of material previously in said combustion zone serve to ignite material newly introduced into the combustion zone, a briquetting machine, and including means connected to said construction for delivering said metallic pieces from said first outlet directly to said briquetting machine for thereby forming briquets made up of large numbers of said pieces.

Re. 28,788
LOAD RESTRAINER

George R. Williamson, III, 1034 Lioncrest Drive, Richton Park, Ill. 60471

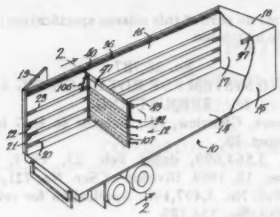
Original No. 3,782,758, dated Jan. 1, 1974, Ser. No. 289,955, Sept. 18, 1972. Application for reissue Apr. 10, 1975, Ser. No. 566,838

Int. Cl.³ B60P *7/00*

U.S. Cl. 280—179 R 21 Claims

1. A load restrainer, comprising: vertically extending support means adapted to be supported within a container, a plurality of horizontal restraining belts engaging said support means, fasteners on each end of said restraining belts cooper-

ating with fasteners means adapted to be mounted on the container walls, and means permitting vertical adjustment of



the belts with respect to the support means to accommodate different location fasteners within the container.

Re. 28,789

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING CYCLIC CIS-α-DICARBONYL COMPOUNDS AND SELECTED SENSITIZERS

Catherine Teh-Lin Chang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Original No. 3,756,827, dated Sept. 4, 1973, Ser. No. 220,694, Jan. 25, 1972. Application for reissue Aug. 28, 1975, Ser. No. 608,673

Int. Cl.² G03C *1/94*, *1/68*; C08F *2/46*

U.S. Cl. 96—86 P **12 Claims**

1. A photopolymerizable composition comprising

(a) at least one non-gaseous ethylenically unsaturated compound having a boiling point above 100° C. at normal atomspheric pressure and being capable of forming a high polymer by photoinitiated, addition polymerization;

(b) a cyclic cis-α-dicarbonyl compound, the excited state of which cannot react intramolecularly, *the atoms adjacent to the two vicinyl carbonyl groups being saturated when they are carbon atoms*; and

(c) an actinic radiation absorbing compound capable of sensitizing the polymerization initiating action of said cyclic cis-α-dicarbonyl compound, said actinic radiation absorbing compound being a nitrogen-containing aromatic or heterocyclic compound, having maximum absorption below 520 nm., selected from the class consisting of bis(p-aminophenyl-α,β-unsaturated) ketones; bis-(alkylamino) acridine dyes; cyanine dyes containing two heterocyclic rings joined by a single methine group; styryl dye bases; 7-diloweralkylamino-4 lower alkyl coumarins; p-aminophenyl ketones; p-dialkylaminophenyl unsaturated compounds; and 6-dialkylaminoquinaldines.

Re. 28,790

HIGH-STRENGTH LOW-ALLOY STEELS HAVING IMPROVED FORMABILITY

Michael Korchynsky; John David Grozier, and John L. Mihelich, all of Bethel Park, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Original No. 3,666,570, dated May 30, 1972, Ser. No. 842,407, July 16, 1969. Application for reissue Nov. 11, 1974, Ser. No. 522,524

Int. Cl.² C22C *38/04*

U.S. Cl. 148—36 **9 Claims**

1. A [kill] *killed* high-strength low-alloy steel which has been hot-rolled finished in the temperature range 1550° F. to 1650° F., cooled at a rate within the range of 20° F. to 135° F. per second, and collected within a temperature range of 1025° F. to 1175° F., the steel being characterized in a hot-rolled condition by a yield strength in excess of 45,000 p.s.i., an ultimate tensile strength in excess of 60,000 p.s.i., ductility as measured by percent elongation (2 inches) in excess of 20%, good toughness and formability and reduced directionality, said steel consisting essentially of .06% to .20% carbon, .50% to 1.4% manganese, a strengthening agent selected from the group consisting of .01% to .08% columbium and .04% to .12% vanadium, .5% maximum silicon, sulfur in an amount up to .04%, .04% maximum phosphorus, a sulfide inclusion shape-control agent selected from the group consisting of

.06% to .20% zirconium, .01% to .10% of a rare earth and .01% to .10% mischmetal, balance iron, the sulfide inclusions in the steel having a substantially spherical shape, *said zirconium being present in a minimum of 0.02 zirconium +6.5 (wt. percent N)*.

Re. 28,791

HIGH-STRENGTH PLAIN CARBON STEELS HAVING IMPROVED FORMABILITY

Michael Korchynsky; John David Grozier, and John L. Mihelich, all of Bethel Park, Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Original No. 3,671,336, dated June 20, 1972, Ser. No. 842,338, July 16, 1969. Application for reissue Nov. 11, 1974, Ser. No. 522,526

Int. Cl.² C22C *38/02*

U.S. Cl. 148—36 **6 Claims**

1. A killed high-strength plain carbon steel which has been hot-rolled finished in the temperature range 1550° F. to 1650° F., cooled at a rate within the range of 20° F. to 135° F. per second, and collected within a preferred temperature range of 1025° F. to 1175° F., the steel being characterized in a hot rolled condition by a yield strength in excess of 35,000 p.s.i., an ultimate tensile strength in excess of 55,000 p.s.i., ductility as measured by percent elongation (2 inches) in excess of 30%, good toughness and formability, said steel consisting essentially of .06% to .20% carbon, .4% to 1.2% manganese, .005% to .3% silicon, sulfur in an amount up to .04%, .04% maximum phosphorus, a sulfide inclusion shape-control agent selected from the group consisting of .05% to .20% zirconium, .01% to .10% of a rare earth and .01% to .10% mischmetal, balance iron, the sulfide inclusions in the steel having a substantially spherical shape.

Re. 28,792

ELECTROCHEMICAL METHOD FOR SEPARATING O_2 FROM A GAS; GENERATING ELECTRICITY; MEASURING O_2 PARTIAL PRESSURE; AND FUEL CELL

Roswell J. Ruka, Pittsburgh, Pa., and Joseph Weissbart, Palo Alto, Calif., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original No. 3,400,054, dated Sept. 3, 1968, Ser. No. 534,322, Mar. 15, 1966. Continuation-in-part of Ser. No. 126,098, July 24, 1961, abandoned. Application for reissue Mar. 22, 1974, Ser. No. 454,021

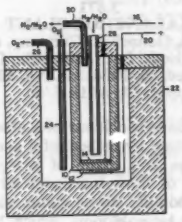
Int. Cl.[2] H01M *8/12;* C25B *1/02*

U.S. Cl. 204—1 T 11 Claims

1. A fuel cell comprising: a solid partition of a solid electrolyte consisting essentially of a solid solution of oxides having a high degree of oxygen ion conductivity compared with either electronic conductivity or cation conductivity, said solid electrolyte having the formula

$$(MO_2)_{1-x}(R_yO_z)_x$$

where M represents at least one tetravalent element forming an oxide highly stable at temperatures of about 500°C to about 1200°C selected from the group consisting of zirconium, thorium and hafnium, R represents at least one element from the group consisting of elements of Groups II-A and III-B of the Periodic Table which form cations with stable +2 and +3 valences in the oxide, x represents a number having a value from about 0.05 to about 0.3 and y and z represent numbers having values necessary to make (R_yO_z) electrically neutral; a first porous electrode consisting of lanthanum nickel oxide applied to a first face of said partition; a second porous electrode consisting of a mixture of nickel and platinum applied to the opposite face of said partition; said electrodes being stable at temperatures of about 500°C to about 1200°C; [mean] *means* for supplying gas containing oxygen to said first electrode; means for supplying a fuel capable of reacting with oxygen on the opposite side of said partition near to said second electrode; means for heating said electrodes to an elevated temperature of about 500°C to 1200°C



whereby oxygen forms ions at said first electrode which migrate through said partition upon placing it in a closed circuit and react with said fuel at the second electrode, said electrodes thereby developing a potential difference; and means for withdrawing the reaction products from near said second electrode.

PLANT PATENTS

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

GRANTED APRIL 27, 1976

3,871
KALANCHOE PLANT

Norbert Bull, Gonnebek, Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Dec. 20, 1974, Ser. No. 535,128
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of Kalanchoe plant particularly characterized by its beautiful and distinctive leaf structure, leaf size and shape of margins; very quick propagation, ease of flowering under adverse conditions during summer months; strong stems which carry large umbels; relatively large blooms, which have a diameter of 18 mm.; coral red flower color, and by its durability and long keeping quality.

3,872
KALANCHOE PLANT

Norbert Bull, Gonnebek, Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Dec. 20, 1974, Ser. No. 535,199
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Kalanchoe plant characterized particularly by its firm and uniform growth, numerous medium sized umbels on strong stems, with the red flowers comprising each umbel being arranged to form a round flower ball; superior blooming habit, and by its excellent keeping qualities.

3,873
KALANCHOE PLANT

Norbert Bull, Gonnebek, Germany, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Dec. 20, 1974, Ser. No. 535,200
Int. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Kalanchoe plant characterized particularly by its bright deep red flowers which possess strong luminous power and in which a bulging white pistil is prominently contrasted; large umbels on very strong stems; relatively large blooms, and by its long keeping qualities.

3,874
GERANIUM PLANT

William E. Duffett, Akron, Ohio, and Walter W. Knicely, Inwood, W. Va., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 6, 1975, Ser. No. 556,126
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium plant characterized particularly by its red flower color with minimal color oxidation, prolific flowering traits under outdoor summer conditions in Ohio, medium green glossy foliage, vigorous trailing growth habit with long internode length, and by its fair foliage durability with slight breakdown under outdoor summer conditions in Ohio.

3,875
GERANIUM PLANT

William E. Duffett, Akron, Ohio, and Walter W. Knicely, Inwood, W. Va., assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 6, 1975, Ser. No. 556,127
Int. Cl. A01h *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of geranium characterized particularly by its maroon red flower color with minimal color oxidation, prolific flowering traits under outdoor summer conditions in Ohio, medium green glossy foliage, vigorous trailing growth with long internode length, and by its fair foliage durability with slight breakdown under outdoor summer conditions in Ohio.

PATENTS

GRANTED APRIL 27, 1976

ERRATA

For CLASS	See PATENT NO.
061–072.4	3,952,532
073–010	3,952,566
073–023	3,952,567
099–474	3,952,609
092–184	3,953,213
151–013	3,953,267
526–247	3,953,413
526–348	3,953,414
526–304	3,953,544
357–044	3,953,866

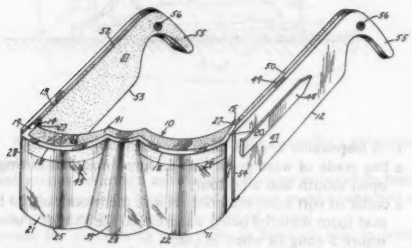
PATENTS

GRANTED APRIL 27, 1976

NOTE – A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

3,952,331
PROTECTIVE EYE SHADE FOR SPORTSMEN
Thomas Melville, 65-46 100th St., Flushing, N.Y. 11365
Filed Oct. 9, 1974, Ser. No. 513,326
Int. Cl.² A61F *9/00*
U.S. Cl. 2—14 H **3 Claims**



1. A protective eye and face shield for sportsmen comprising: a unitary transparent front element of high impact synthetic resinous material, said element including integrally molded first and second covers adapted to overlie the eyes of a wearer, and a nose piece interconnecting said covers and adapted to overlie at least a portion of the nose of said wearer, said nose piece being so contoured that the weight of said element is distributed along the length thereof when the device is worn; said front element being bounded by an upper edge lying in a horizontal plane, and a lower edge substantially parallel to said upper edge; and left and right planar temple elements pivotally interconnected substantially at forward edges thereof to side edges of said front element, said temple elements having a vertical height substantially equal to that of said frontal element; a padding member of generally elongated configuration secured to an upper edge portion of the inner surface of said front element, and extending between left and right temple elements, said padding member having an exposed rearward surface adapted to lightly contact the brow of a wearer; and planar padded members secured to the inner surfaces of said temple elements to cushion said temple elements relative to the sides of head of said wearer, said temple elements having rearwardly positioned means for engaging the ears of said wearer; whereby upon the occurrence of an impact from a golf ball or similar missile upon an exposed surface of said shield, said impact is absorbed by the flexing of said resinous material and compression of said padding member.

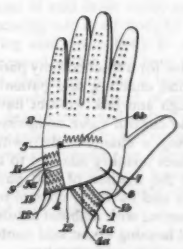
3,952,332
APRON
Opal B. Tanner, 802 W. Chambers, Cleburne, Tex. 76031
Filed Mar. 17, 1975, Ser. No. 558,853
Int. Cl.² A41B *13/10*
U.S. Cl. 2—48 **1 Claim**

1. An apron for use in hanging wash items on a clothesline, said apron formed on its front with a continuous open pouch extending the full width of the apron, for the carrying of wash items to be hung on a line,

said apron and pouch formed of a continuous sheet of flexible waterproof material, said sheet externally folded about the bottom border of the apron to form the pouch, with the side edges of the pouch bonded to the front of the apron, together with a pocket formed on the apron front, located above the mouth of the pouch of a size to contain clothespins,

said pouch formed with a lip folded over the mouth of the pouch and extending over the front of the pouch to form a rounded front top pouch edge for ease in inserting wash items into the pouch.

3,952,333
GOLF GLOVE
Isamu Fujita, 6-1, 8-chome, Arakawa, Arakawa, Tokyo, Japan
Filed Feb. 13, 1975, Ser. No. 549,670
Claims priority, application Japan, Nov. 27, 1974, 49-142670[U]
Int. Cl.² A41D *19/00*
U.S. Cl. 2—161 A **8 Claims**



1. A golf glove comprising a body including a front palm, back and finger portions, a wrist encircling bottom edge, a notch in the back portion of the body extending from the bottom edge toward the finger portion, a band secured to the wrist encircling bottom edge and terminating at the boundary of the notch, the band extending along the bottom of the front body portion slightly below the palm bulge thereof, each end of the band extending to the back body portion at an oblique angle in a direction toward the finger portion so that the projected ends of the band cross each other at the back body portion, and fastener members secured to opposite sides of the notch for closing it.

3,952,334

BIOCOMPATIBLE CARBON PROSTHETIC DEVICES

Jack C. Bokros, and Jere B. Horsley, Jr., both of San Diego, Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Nov. 29, 1974, Ser. No. 527,971
Int. Cl.² A61F 1/24, 1/22
U.S. Cl. 3—1 11 Claims

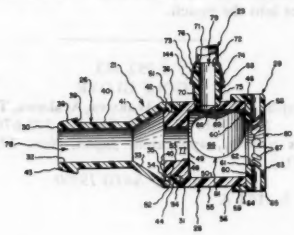
1. A biocompatible prosthetic device comprising a metal alloy substrate, an intermediate, continuous layer of an organic high-temperature polymer which is strongly bonded thereto, and an exterior in-situ-deposited coating of continuous dense vapor-deposited carbon at least 1000A thick which carbon layer is biocompatible and strongly adherent to said intermediate layer as a result of its in situ vapor deposition.

3,952,335

LARYNGEAL PROSTHESIS

Peter S. Sorce, Tonawanda, and Earl W. Clifford, Getzville, both of N.Y., assignors to The Aro Corporation, Bryan, Ohio

Filed Sept. 25, 1974, Ser. No. 509,262
Int. Cl.² A61F 1/20
U.S. Cl. 3—1.3 15 Claims



10. A control valve for a tracheotomy patient provided with a trachael fistula and enabling said patient to automatically inhale, exhale, cough and talk without having to cover said trachael fistula, said control valve comprising:

a housing defining a chamber therewithin, said housing having a trachael opening adapted to communicate said chamber with the trachea of said patient through said trachael fistula and having a control opening communicating said chamber with ambient atmosphere, a marginal portion of said housing about said control opening defining a seat facing into said chamber;

a flapper mounted on said housing in said chamber and having a flexible peripheral marginal portion, said flapper being adapted to move away from said control opening when said patient inhales, toward said control opening when said patient normally exhales, toward said control opening to cause said flapper marginal portion to sealingly assume the contour of said seat when said patient selectively exhales air with sufficient force, and to pass through said control opening by deformation of said flapper marginal portion when said patient coughs;

whereby said patient may inhale, exhale and cough through said control opening, and may speak by selectively exhaling air at such force sufficient to cause said flapper to move toward and close said control opening.

3,952,336

DISPOSABLE BEDPAN DEVICE

Sona V. Kunter, and Margaret Harrison, both of New York, N.Y., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 25, 1975, Ser. No. 552,843
Int. Cl.² A61G 9/00
U.S. Cl. 4—112 1 Claim

1. A disposable bedpan device, comprising

a bag made of waterproof soft-textured material having an open mouth and a bottom;

a collar of soft foam material around the mouth of the bag, said foam material being adherent to the skin of a user to insure a snug fit when in use;

substantially flexible wire embedded in the collar and extending around the mouth for adjusting the opening of the mouth of the bag; and

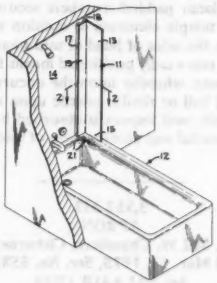
a sheet of substantially flexible material in the bag and extending substantially parallel to the bottom and intermediate the bottom and the mouth of the bag, said sheet having openings formed therethrough whereby said sheet obstructs solid matter and permits liquids to pass to the bottom of the bag.

3,952,337

WATER DEFLECTOR FOR BATHING FACILITIES

Carol S. Hansow, 3247 Impala Drive, Apt. 1, San Jose, Calif. 95117

Filed Mar. 13, 1974, Ser. No. 450,652
Int. Cl.² A47K 3/14, 3/22
U.S. Cl. 4—148 1 Claim



1. A water deflecting rib for confining water in bathing facilities comprising,

an upright body portion adapted for mounting on a wall, and including a fixed base member and a co-extensive member overlapping and slidably adjustable relative to said fixed base member so that said upright body portion may be extended to meet a selected drain path, and

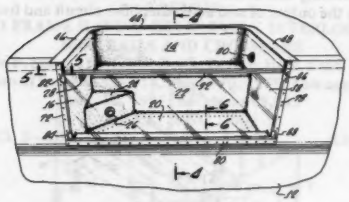
means inter-connecting said fixed base member and said adjustable member for holding said members in relatively adjusted positions.

3,952,338

THERAPY BASIN

Robert S. Troxclair, 1365 Norman Road, Colton, Calif. 92324

Filed Apr. 21, 1975, Ser. No. 570,171
Int. Cl.² E04H 3/16, 3/18
U.S. Cl. 4—172.15 14 Claims



1. A combined pool entry and therapy basin for a swimming pool comprising

wall means defining a self-contained water impervious basin open at one side thereof and adapted to be connected as a unit to an opening in the wall of a pool,

means for connecting said basin at its open side in water tight relation to the wall of a pool at said opening thereof,

support means carried on said wall means for supporting the body of a person in said basin, below the water line, and

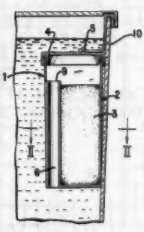
air jet means in said wall means for directing a plurality of airjets into the interior of said basin.

3,952,339

AUTOMATIC TOILET CLEANING DEVICE

Edmund Baur, Ratingen; Bernd-Dieter Holdt, Dusseldorf; Hans Werner Ratering, Sturzelberg; Georg Thesing, Monheim, and Erich Turk, Langenfeld-Reusrath, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Sept. 23, 1974, Ser. No. 508,053
Claims priority, application Germany, Sept. 29, 1973, 2349067
Int. Cl.² E03D 9/04, 9/02
U.S. Cl. 4—228 4 Claims



1. In an automatic toilet cleaning device made of a solid water-insoluble material consisting essentially of a container adapted for holding a solid cleanser to be dissolved, a cover for said container, a suspension means for holding said device in a water tank, an inlet means and an outlet means adapted for conducting flushing water, the improvement which comprises the combination of:

a. said container having an essentially oval cross-section with an even flat side-wall, and said container having a specific gravity greater than that of water;

b. a standpipe adapted for conducting flushing water, said standpipe being open at the top and at the bottom; said standpipe being attached to approximately the center of said ovally curved side of and within said container;

c. said standpipe having a height of about 80% of the height of said container and having at its upper end an open cross-sectional area positioned above said standpipe of about 2 to 10 mm²;

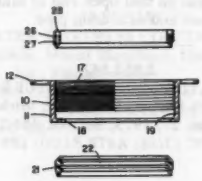
d. said cover being seated tightly fitting onto said container and having two holes which are located at about the same distance from the standpipe as well as being close to said even flat side-wall, and said holes being a distance from each other that is equal to or greater than the horizontal distance to the standpipe, and said cover having a specific gravity lower than that of water.

3,952,340

TOILET DRAIN

Casper Cuschera, 31650 Medinah St., Hayward, Calif. 94544

Filed Nov. 25, 1974, Ser. No. 527,125
Int. Cl.² E03D 11/00; E03C 1/26
U.S. Cl. 4—252 R 2 Claims



1. A toilet drain comprising a drain body having a bore extending therethrough for receiving a waste discharge pipe, said bore including an inwardly directed taper at the lower end thereof and internal threads in the upper portion thereof; a flange entending outwardly from the upper end outwardly from the upper end of said drain body, said flange including first means for securing said drain body to a floor, and second means for securing said drain body to a toilet; a resilient sealing gasket disposed within said bore and about said discharge pipe, said gasket including a tapered lower exterior surface to accommodate said taper of said bore and upper surface bevelled downwardly and outwardly; and nut means for expanding said gasket radially and compressing said gasket axially, said nut means including an externally threaded nut received in said bore and including a lower surface extending obliquely downwardly to cooperatively impinge on said bevelled upper end of said gasket.

3,952,341

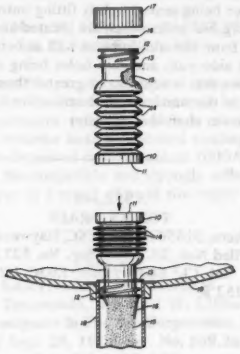
METHOD AND DEVICE FOR CLEARING A STOPPED UP DRAIN

James F. Cain, 1221 Velma Court, Youngstown, Ohio 44512

Filed Apr. 18, 1975, Ser. No. 569,538
Int. Cl.² E03D 11/00
U.S. Cl. 4—255 6 Claims

1. A collapsible container for a caustic material useful in opening a stopped up drain, said collapsible container having a tubular body with a closed end and an open end, a sealing disc secured to said open end and a cap-like closure removably positioned thereover and mechanically engaged on said container, the body of said container comprising a bellows-

like configuration movable from a first position wherein said bellows is extended to a second position where said bellows is



contracted and means on said open end of said container for registry with the open end of a drain pipe.

3,952,342

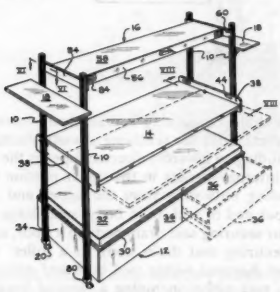
MULTIPURPOSE FURNITURE

James E. Hart, 1420 Harpst, Ann Arbor, Mich. 48104

Filed Jan. 27, 1975, Ser. No. 544,227

Int. Cl.² A47C *13/38*; A47B *81/00*; 108 *10;147*

U.S. Cl. 5—2 R 9 Claims



1. Multipurpose furniture comprising a combination bed and table comprising, in combination, a plurality of spaced, substantially parallel, vertically disposed elongated columns, a bed platform mounted upon said columns and supported thereby, a substantially flat table mounted on said columns disposed vertically above said bed platform and extending thereover, adjustable means mounting said bed platform and said table upon said columns whereby said platform and table may be vertically adjustably positioned upon said columns, and vertically adjusted relative to each other.

3,952,343

AUTOMATIC BABY CRIB ROCKER

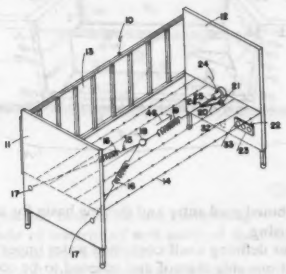
Gim Wong, 1849 Gibbs Road, Estevan, Saskatchewan, Canada

Filed July 29, 1974, Ser. No. 492,416

Int. Cl.² A47D *9/02*

U.S. Cl. 5—109 3 Claims

1. A voice actuated rocking mechanism for operative attachment to a baby's crib or the like and including a source of electrical power; comprising in combination a normally stable spring system operatively connected to the associated crib, solenoid coil means operatively connected to said spring system and being connectable to said source of electrical power, a microphone, an audio amplifier circuit operatively connected to said microphone and to said source of electrical power, means operated by the output of said audio amplifier circuit to operate said solenoid coil means and being connectable to said source of electrical power, a timer circuit for disconnecting said solenoid coil means from said means operated by the output of said audio amplifier circuit and from said



source of electrical power, said timer circuit including means to adjust the duration of said timer circuit within limits by an RC time constant, means operatively connected to said solenoid coil means to make and break the electrical circuit thereto, manually operated switch means operatively connected to said circuit to initiate said rocking action manually if desired and adjustable speed control means operatively connected to said solenoid coil means to control the actuation of said means to make and break the electrical circuit to said solenoid coil means.

3,952,344

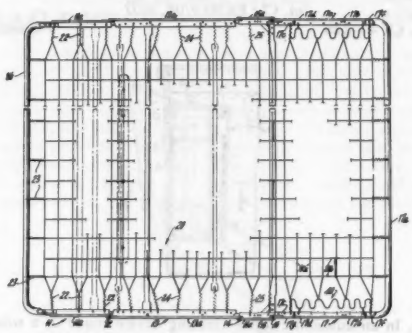
PULL-OUT FOLDING SOFA BEDS

Izchak Cycowicz, Brooklyn, N.Y., and John Wong, Jersey City, N.J., assignors to Mohasco Corporation, Amsterdam, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,714

Int. Cl.² A47C *17/14*

U.S. Cl. 5—186 R 13 Claims



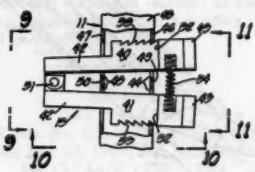
1. A folding, pull-out sofa-bed comprising a plurality of interpivoted bed sections including a front foot section projecting forwardly in the open, sleeping position of said bed, said foot section comprising a frame member having a front cross bar and side arms extending rearwardly therefrom, in said open, sleeping position of said bed, said side arms having vertically, upwardly offset portions in said open, sleeping position of said bed, mattress supporting fabric and means to attach said fabric to said sections of said bed, said offset portions being vertically offset, downwardly in the fully folded position of said bed, zig-zag springs at the inner sides of said side arms, and extending longitudinally of and longside of the

offset portions of said side arms, and means to attach said zig-zag springs adjacent outer ends thereof, to the respective side arms, and means to attach said zig-zag springs to said mattress supporting fabric between the outer ends of said offset portions, said zig-zag springs each having inwardly projecting bends, and outwardly projecting bends.

3,952,345
BED FRAME HAVING RELEASABLY INTERLOCKED SIDE RAILS AND CROSSBARS

Melvin P. Spitz, 619 N. Elm Drive, Beverly Hills, Calif. 90210

Division of Ser. No. 556,914, March 10, 1975. This application Aug. 18, 1975, Ser. No. 605,543
Int. Cl.² A47C *19/04*
U.S. Cl. 5—207 **13 Claims**



1. In a bed frame having an elongate side rail with an upper flange providing a support for a box spring adapted to project outwardly therebeyond, a box spring locating and retaining clip structure, comprising:

a. a generally L-shaped body structure having a base leg and a shorter right angled leg at one end thereof;

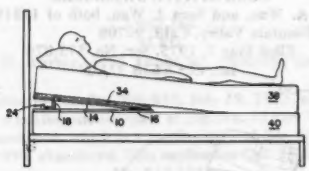
b. means adjustably mounting said body on said rail for movements in extendable and retractable directions with said base leg extending transversely of the rail below said upper flange and with said end leg being positioned outwardly of said upper flange and projecting above the plane thereof to engage a projecting side of the box spring; and

c. means for releasably latching said body against movement in said extendable direction from an adjusted position.

3,952,346
COLLAPSIBLE ELEVATING BOARD FOR BED MATTRESSES

Maurice F. Carlson, 6345 Oakman Blvd., Dearborn, Mich. 48126

Filed Mar. 14, 1975, Ser. No. 558,482
Int. Cl.² A47C *21/00*
U.S. Cl. 5—327 B **1 Claim**



1. A collapsible elevating board for bed mattresses comprising a flat base, a tiltable member pivotally connected on the forward end to the flat base, a transverse foot pivotally attached to the lower side of the tiltable member having both an extended and a retracted position, a pivoted riser on the flat base disposed below the transverse foot having both an upright and a collapsed position, such riser being adapted in both its upright and collapsed positions to holdably engage the transverse foot when the latter is in its extended position so as to provide selective alternate elevations for the tiltable member.

3,952,347
BIODEGRADABLE BARRIER FILM AND ABSORBENT PAD UTILIZING SAME

John M. Comerford, Morganville, and Chandra Kapur, East Brunswick, both of N.J., assignors to Personal Products Company, Milltown, N.J.

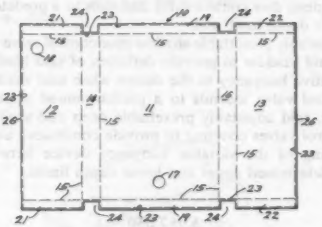
Filed Dec. 13, 1973, Ser. No. 424,404
Int. Cl.² A61F *13/00*; A61G *7/04*; C08L *3/02, 89/00*
U.S. Cl. 5—335 **13 Claims**

1. A biodegradable barrier film comprising a matrix of a non-biodegradable film-forming material which is resistant to solubility in water having a biodegradable material homogeneously dispersed therein, said biodegradable material being present in said film in an amount from about 40 to about 60 percent by weight based on the total weight of said biodegradable material and said non-biodegradable film-forming material in said film, said film resisting the passage of body discharge fluids therethrough.

3,952,348
WATER MATTRESS CONSTRUCTION

Gary L. Benjamin, Mount Blanchard, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio

Filed Sept. 2, 1975, Ser. No. 609,437
Int. Cl.² A47C *27/08*
U.S. Cl. 5—370 WI **2 Claims**



1. A water mattress of three-dimensional, rectangular box-like construction fabricated from a unitary sheet of a flexible material, comprising a top panel, a pair of vertical side panels folded downward on either side of the top panel, a pair of upper end panels folded downward at either end of the top panel, a first bottom panel portion folded horizontally inwardly from the lower edge of one of the vertical side panels, a second bottom panel portion folded horizontally inwardly from the lower edge of the other of the vertical side panels and in lap-seamed engagement with the first bottom panel portion, a first pair of lower end panels folded vertically upward at either end of the first bottom panel portion and in lap-seamed engagement with the corresponding edges of the upper end panels above, a second pair of lower end panels folded vertically upward at either end of the second bottom panel porton and in lap-seamed engagement with the corresponding edges of the upper end panels above, a lap seam between the adjacent edges of adjacent lower end panels at each end of the mattress, and lap seams at each corner of the mattress among the side panels, the upper end panels and the lower end panels.

3,952,349

VARIABLE BUOYANCY DEVICE

Robert L. Erath, Seaford; Mathias A. Speidel, St. James, and Edward J. Kennelly, Bayport, all of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,950
Int. Cl.² B63G 8/14
U.S. Cl. 9—8 R 23 Claims

16. A variable buoyancy device for automatically cycling an instrument between upward and downward limits on a cable moored in water, comprising:

a SCUBA tank including a pressurized gas of low molecular weight;

a regulator valve coupled to said SCUBA tank to reduce the output gas pressure to a predetermined level which is greater than the ambient water pressure;

a bladder mechanically coupled to said regulator valve for inflation in response to gas exiting from said SCUBA tank;

an adjustably presettable deep dive control valve coupling said regulator valve to said bladder to provide inflation of said bladder and positive buoyancy to the device when said deep dive control valve descends to a predetermined lower depth limit; and

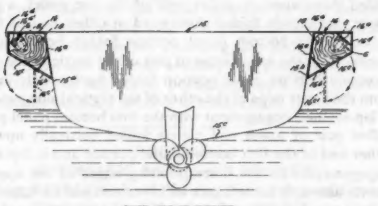
an adjustably presettable shallow dive control valve coupled to said bladder to provide deflation of said bladder and negative buoyancy to the device when said shallow dive control valve ascends to a predetermined upper depth limit, said adjustably presettable deep and shallow dive control valves coacting to provide continuous automatic cycling of the variable buoyancy device between the predetermined upper and lower depth limits.

3,952,350

GRAVITY WEIGHT TRIGGER FOR A LIFE RAFT

Emil Moucka, Rte. 4, Ennis, Tex. 75119

Filed Oct. 4, 1974, Ser. No. 512,000
Int. Cl.² B63C 9/04
U.S. Cl. 9—11 A 11 Claims



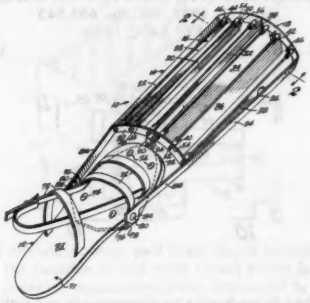
9. In a life raft inflating device, a pressurized cylinder; a deflated life raft; conduit means between the life raft and the cylinder; a valve member; resilient seat; a spring urging the valve member away from said seat; and a counterweight means adapted to hold said valve member closed until the inflating device becomes inverted when said counterweight means is actuated to release said valve member, to allow said spring to open said valve and inflate said life raft.

3,952,351

SWIMMING AID DEVICE

Miguel Gisbert, 4355 E. 8th Lane, Hialeah, Fla. 33013

Filed Mar. 24, 1975, Ser. No. 561,211
Int. Cl.² A63B 31/14
U.S. Cl. 9—304 9 Claims



1. A swimming aid device comprising:

A. an article of footwear including,

1. means to attach said article to the foot of a wearer;

B. a main, elongated frame assembly, extending forwardly of said article of footwear, including,

1. front and back walls, and

2. spaced apart side walls defining an elongated central opening;

C. a plurality of vanes pivotally connected in said central opening at their respective upper edge end portions between said front and back walls and being pivotal between first, generally parallel open positions relative to said central opening, and second, overlapping positions in a substantially closing relation to said central opening;

D. means to connect said main elongated frame assembly to said article of footwear;

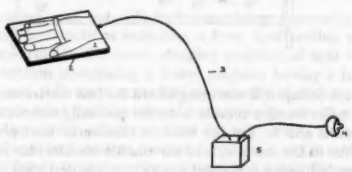
E. said means to connect comprises a pair of rearwardly extending arms from the respective side walls of said main frame and a sole plate connected between said rearwardly extending arms and a sole portion of said article of footwear.

3,952,352

ELECTRONIC STROKE EFFECTIVENESS SENSOR FOR COMPETITIVE SWIMMERS

Lawrence A. Wan, and Sara J. Wan, both of 17819 Joshua Circle, Fountain Valley, Calif. 92708

Filed May 2, 1975, Ser. No. 573,876
Int. Cl.² A63B 31/02
U.S. Cl. 9—307 5 Claims



1. A hand and/or arm worn apparatus that senses and measures the propulsion generated in water by a swimmer's arm

stroke as the swimmer strokes through the water comprising of:

a. pressure sensitive transducers worn on the hand and/or arm that convert the thrust generated by the arm stroke as water pressure is created against the transducers into electric signals,

b. a miniature electronic battery powered package worn on the swimmer that generates an audible tone into the swimmer's ear through a small earpiece such that the tone frequency or pitch is heard by the swimmer and varies directly as a function of the water pressure as thrust is generated against the transducers to give the swimmer a feedback indication of the effectiveness of his stroke form in delivering propulsion through the water, and

c. a miniature radio transmitter worn on the swimmer's body that transmits the signals from the transducer to a remote pool-side meter and recorder to provide remote monitoring, measurement, and recording of the thrust generated in quantitative units.

3,952,353

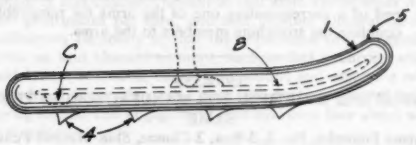
SKI WALKERS

John H. Word, Rte. No. 2, Box 341, Frankfort, Ky. 40601

Filed July 22, 1974, Ser. No. 490,880

Int. Cl.² A63C *15/02, 15/04*

U.S. Cl. 9—310 D **1 Claim**



1. A one piece, flexible, inflatable device for converting a water ski to a buoyant water walking apparatus, comprising:

a pair of integrally formed inflatable tubes, one of said tubes extending around and engaging the entire periphery of said water ski and the other of said tubes extending along and forming a support for a bottom portion of said water ski,

said tubes being provided with openings to allow air to pass from one tube to the other;

the tubes, when inflated, forming an elongated pocket for receiving and gripping said water ski;

the one of said tube being provided with transversely extending strap means to assist in attaching the inflatable device to said water ski, and

the other of said tubes being provided with propulsion cups on a bottom portion thereof to assist in moving said buoyant apparatus over the surface of the water.

3,952,354

SLED

Richard W. Turner, 1786 Tubbs St., Thousand Oaks, Calif. 91360

Continuation of Ser. No. 380,832, July 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 272,097, July 17, 1972, abandoned, which is a continuation of Ser. No. 94,878, Dec. 3, 1970, abandoned. This application Oct. 23, 1974, Ser. No. 517,152

Int. Cl.² B62B *13/00*

U.S. Cl. 9—310 B **2 Claims**

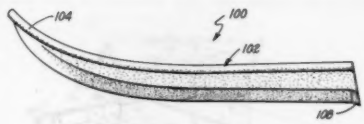
1. A sled comprising:

a body having front and rear ends,

said body having an undersurface which slopes upwardly in each lateral direction from its longitudinal centerline and longitudinal edges whose forward portions curve inwardly toward and merge at said centerline to provide said body with a rounded prow,

a seat extending across the extreme rear end of said body, at least the forward portion of said body curving upwardly with a relatively sharp curvature, whereby said prow is upswept and rises above said seat in a normal sledding position of said sled with a rider on said seat, and

a downwardly and rearwardly sloping inclined ramp surface at the underside of said body and extending across the



extreme rear end of said body directly below said seat, whereby in the normal sledding position of said sled in water with a rider on said seat, said ramp surface is submerged in the water and produces on the rear end of said body an upwardly planing force for holding said prow down in the water when the sled is towed forwardly through the water.

3,952,355

INFLATABLE BUOYANCY AIDS

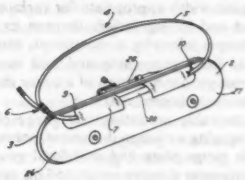
David Paul Bardebes, 12 Yatton St., Tauranga, New Zealand

Continuation-in-part of Ser. No. 468,355, May 9, 1974, abandoned. This application Oct. 30, 1974, Ser. No. 519,392

Claims priority, application New Zealand, Sept. 24, 1973, 172049

Int. Cl.² B63C *9/18*

U.S. Cl. 9—316 **9 Claims**

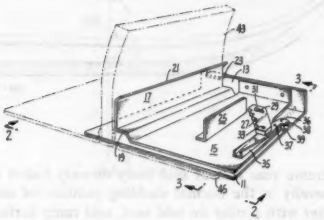


1. An inflatable bouyant device comprising an elongate inflatable member having a straight longitudinal axis extending from end to end of the member, securing means attached to and extending from said inflatable member and adapted to encircle the trunk part of the body of a person so that said securing means lies substantially in a plane substantially parallel to the longitudinal axis of the elongate member, an actuating device associated with a gas producing means located in or adjacent the inflatable member such that on operation of the actuating device an amount of gas flows into the inflatable member so as to inflate it and provide buoyancy for a person about which the securing means has been secured characterized in that the securing means extends from two positions spaced apart and removed from each end of the inflatable member to leave two end portions of the inflatable member, when inflated and when secured to the front of the trunk part of the body of the person by the securing means, extending in substantial tangential fashion from the body of the person.

3,952,356
GAUGE AND ALIGNMENT DEVICE FOR ATTACHING COVERS TO BOOKS

Joe D. Giulie, and Leslie E. Worcester, both of Palo Alto, Calif., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Feb. 21, 1975, Ser. No. 551,752
Int. Cl. B42c *11/00*
U.S. Cl. 11—3 **7 Claims**



1. A device providing a combined cover alignment gauge for selecting a cover of a proper size to fit a given document and a cover alignment jig whereby a prebound document to be covered can be centered on a cover of the selected size, said device being for use with prefabricated covers having front and back members of uniform size to accommodate pages of a given size, said front and back members being flexibly connected through a central spine member, said spine member being manufactured in a variety of width increments to accommodate documents of various thicknesses, said prefabricated covers having attachment means whereby said covers can be attached to a prebound document, said device comprising in combination:

a. a frame including a plate having a surface for supporting a cover, an alignment plate perpendicular to said surface, a fixed gauge stop member, and a movable gauge plate supported on said frame, and movable toward and away from said fixed gauge stop member, said gauge plate having a series of steps thereon in increments corresponding to the spine width appropriate for various documents to be bound and having indicia thereon to identify the individual steps, whereby a document can be placed between said fixed gauge stop and said movable gauge plate to permit proper selection of a cover sized for binding the document chosen, and

b. means for movably mounting said gauge plate on said frame for engaging a chosen document between a step of the movable gauge plate and said fixed gauge stop and means for engaging a cover supported on said surface to position said cover with respect to said surface at a position related to the amount of movement of the gauge plate with respect to said fixed gauge stop for aligning the center of the cover at a spaced position from said alignment plate.

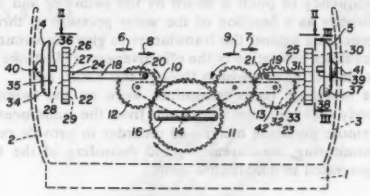
3,952,357
SHOE STRETCHING DEVICE

Bernard O'Sullivan, 120-31 DeKruif Place, Bronx, N.Y. 10475

Filed Jan. 30, 1975, Ser. No. 545,335
Int. Cl.² A43D *5/00*
U.S. Cl. 12—115.2 **2 Claims**

1. A shoe stretching device for corns and bunions for stretching a shoe having a pair of opposite sides each of which is adjacent a corresponding one of the big toe and the small toe of the foot of a wearer of the shoe, said shoe stretching device comprising

a pair of stretching members each shaped to stretch a substantially concave area in a side of a shoe to relieve pressure on a corn, bunion, and the like; and manually operated moving means coupling the stretching members to each other and selectively moving each of the stretching members into and away from the corresponding side of the shoe for stretching the side to a desired extent, said moving means comprising a frame, gear means including a drive gear and driven gears rotatably mounted on the frame, a shaft affixed at one end to and rotatable with the drive gear, a handle at the other end of

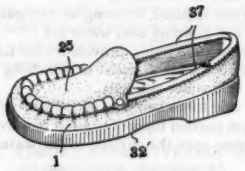


the shaft for rotating the drive gear, and coupling means releasably coupling each of the stretching members to a corresponding one of the driven gears for selective reciprocating movement, said coupling means comprising a pair of arms each pivotally eccentrically affixed at one end to a corresponding one of the driven gears, and a pair of adjustable coupling members each affixed to the other end of a corresponding one of the arms for removably coupling the stretching members to the arms.

3,952,358
SHOE AND A METHOD FOR MANUFACTURING THE SAME

Tatsuo Fukuoka, No. 3, 3-Ban, 2-Chome, Shin-Minami-Fukushima, Tokushima, Japan

Continuation-in-part of Ser. No. 402,967, Oct. 3, 1973, abandoned. This application Oct. 2, 1974, Ser. No. 511,243
Claims priority, application Japan, Nov. 2, 1973, 48-127548[U]; Jan. 18, 1974, 49-8507[U]; May 4, 1974, 49-51055[U]
Int. Cl.² A43D *9/00*
U.S. Cl. 12—142 MC **1 Claim**



1. In a method for integrally manufacturing a shoe of resinous material, the improvement comprising a first step of three-dimensionally molding a lateral side section of plastic resinous material in a molding cavity, a second step of connecting an upper vamp section with said lateral side section, and a third step of connecting a sole with the lateral side section.

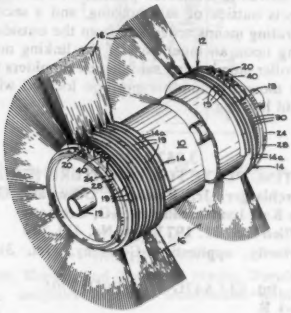
3,952,359
BRUSH STRIP FOR ROTARY COILED BROOM

Richard B. Rosseau, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 20, 1975, Ser. No. 542,316
Int. Cl.² A46B *7/10*
U.S. Cl. 15—182 **8 Claims**

1. In a rotary coiled broom which includes a cylindrical core, a helically coiled brush strip wound about the cylindrical face of said core, said brush strip being comprised of a channel

element and a plurality of radially extending bristles secured within said channel element, and means for securing the ends of said brush strip to the longitudinal ends of said core, the improvement wherein said channel element is provided with a plurality of protrusions on the underside of the base thereof which is in engagement with the cylindrical face of the core, said protrusions being spaced apart by distances along the



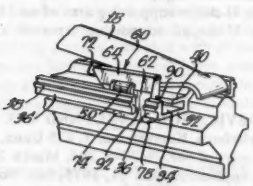
length of said channel element so that there are no more than two protrusions per turn; and said channel element having sufficiently flexibility so that the application of a tensioning force on said channel element, such as that occurring when said broom is loaded, causes it to distort and assume a non-cylindrical shape about said core with portions thereof being spring-loaded into engagement with said core face about said protrusions.

3,952,360

INTEGRAL RETAINING CLIP-REFILL ASSEMBLY

John J. Plisky, Munster, and William H. Harbison, both of Merrillville, Ind., assignors to The Anderson Company, Gary, Ind.

Filed Mar. 25, 1975, Ser. No. 561,908
Int. Cl.² B60S 1/38
U.S. Cl. 15—250.42 **5 Claims**



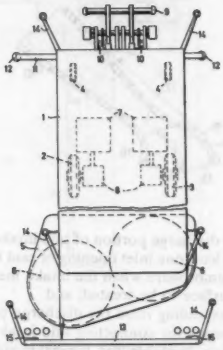
1. A retaining clip for a wiper blade for holding a backing member in assemlbed relationship with a superstructure, said retaining clip having a body member of resiliently flexible material with an outwardly extending head portion projecting transversely from the upper portion thereof, an abutment extending downwardly from the outer end portion of said head portion and having a wall lying substantially parallel to and facing a wall of the body member, said abutment and said head portion having an outwardly facing angled wall converging toward the lower edge of said wall on said abutment, and a foot portion connected to said body member and lying parallel to said foot portion, said foor portion being spaced from said head portion and extending in opposite directions from said body portion.

3,952,361

FLOOR TREATING MACHINES

John Thomas Wilkins, Bushey Heath, England, assignor to R. G. Dixon & Company Limited, Wembley, England

Filed Oct. 4, 1974, Ser. No. 512,310
Claims priority, application United Kingdom, Oct. 5, 1973, 46685/73
Int. Cl.² A47L 5/00
U.S. Cl. 15—319 **6 Claims**



1. In a floor treating machine comprising laterally spaced drive wheels, separate traction motors drivably connected to the wheels and electronic control means to provide separate trains of pulses to operate the motors conjointly for straight line motion and differentially for steering motion: the improvement of means for recording the trains of pulses to the traction motors for recording the path followed by said machine and means for replaying the record to reproduce the trains of pulses whereby the machine will reproduce the original path followed by the machine, and a course correction system coupled between the control means and the motors comprising first sensing devices for sensing the presence of a wall or other physical obstruction in the immediate path of the machine and further sensing devices for sensing the condition of the floor in a predetermined location with respect to the machine, said sensing devices producing overriding signal control to the motors to thereby effect course correction in response to said signals from the sensing devices.

5. A floor treating machine as claimed in claim **1**, including a plurality of rotary floor-engaging brushes, means associated with each brush for feeding fresh cleaning solution into the region thereof, and further sensing devices consisting of transparent take-up pipes associated with the individual brushes for collecting the cleaning solution after brushing on the floor, light sources mounted adjacent each pipe and photo-electric cells mounted opposite thereto, said photo-cells measuring the clarity of the solution taken up and producing a signal that is coupled to the overriding signal control.

3,952,362

NOZZLE DEVICE FOR CLEANSER FOAM SUCTION APPARATUS

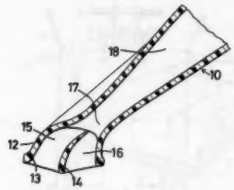
Osamu Torii, No. 10-1,Ueda-8-chome, Matsubara, Osaka, Japan

Filed Nov. 16, 1973, Ser. No. 416,462
Claims priority, application Japan, Dec. 18, 1972, 47-127458
Int. Cl.² A47L 9/02
U.S. Cl. 15—353 **5 Claims**

1. A suction nozzle device to be connected to a vacuum source for removing material from a surface being treated comprising:

hollow intake means having an inlet portion and an outlet portion for receiving and discharging the material to be carried away from the surface and the air coming from the atmosphere by the applied suction;

guide wall means arranged within and projecting beyond the inlet to said intake means for partitioning the hollow space of said inlet means into a plurality of flow passages having inlet openings at the inlet portion of said intake means, said flow passages being completely isolated from each other between the inlet openings of said flow passages and the discharge portion of said intake means, and for leaving at least one inlet opening of said flow passages open to the atmosphere when the intake means is placed against the surface to be treated; and



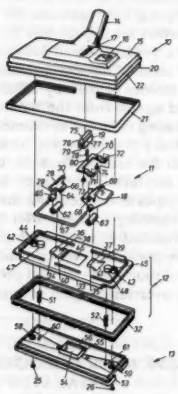
ejector means extending from the discharge portion of the said intake means for connecting said intake means to a vacuum source, said ejector means having a throttle portion formed at the trailing edge of said guide wall means in said discharge portion and a diffuser portion succeeding said throttle portion.

3,952,363

VACUUM CLEANER NOZZLE

Fred Henry Lindman, Hagersten, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed Nov. 4, 1974, Ser. No. 520,668
Claims priority, application Sweden, Nov. 8, 1973, 7315151
Int. Cl.² A47L *9/06*
U.S. Cl. 15—373 **8 Claims**



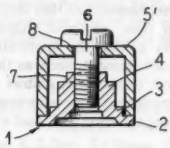
1. A vacuum cleaner nozzle provided with a spring-urged brush that is movable from a first position in engagement with the surface to be cleaned to a second position out of engagement with said surface to be cleaned and vice-versa comprising; a housing, means at the bottom of said housing for confining said brush in said housing but permitting limited movement therein, a cam device including spaced, pivotable roller members, a bracket interconnecting said roller members, said brush including a plate provided with brush bristles, the upper surface of said plate being provided with spaced, shaped shoulder elements that are each adapted to be engaged by a corresponding roller member, said shoulder elements being part of said cam device, linking means joining each roller to said nozzle, the linking means of one of said rollers having an arm provided with a first foot actuated operating means for moving said roller members on said shaped shoulders whereby said brush is moved to a selected position in which a portion thereof projects outside of said housing, and a second foot actuated operating means accessible from the outside of said housing acting upon an inner part of the linking means for moving said roller members on said shaped shoulders whereby said brush is moved to another position located within the interior of said housing.

3,952,364

MOUNTING PLATE FOR FURNITURE HINGES

Karl Lautenschlaeger, Jr., Reinheim, Odenwald, Germany, assignor to Karl Lautenschlaeger KG, Germany

Filed Oct. 31, 1973, Ser. No. 411,282
Claims priority, application Germany, Oct. 31, 1972, 2253370
Int. Cl.² A47G *1/10;* **E05D** *3/06*
U.S. Cl. 16—1 R **2 Claims**



1. A furniture hinge unit comprising:

a longitudinally extending U-shaped supporting arm of a predetermined width;

a hinge mounting plate for mounting said longitudinally extending U-shaped supporting arm, said mounting plate including,

a rigid longitudinal base plate adapted to be secured to a furniture piece and having two substantially parallel longitudinal margins, and

a plurality of step-shaped mounting shoulders along said two longitudinal margins of said base plate to accommodate the U-shape supporting arm of said hinge unit as well as U-shaped supporting arms of a different width.

3,952,365

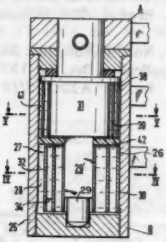
DAMPING DEVICE FOR HINGES AND THE LIKE

Hans-Theodor Grisebach, Kampstrasse 7, 475 Unna, Germany

Continuation-in-part of Ser. No. 345,304, March 27, 1973, abandoned. This application Jan. 21, 1975, Ser. No. 542,805
Claims priority, application Germany, Mar. 27, 1972, 2214965
Int. Cl.² E05F *3/10*
U.S. Cl. 16—52 **11 Claims**

1. A device for applying spring force to, and damping movement of, a movable structure such as a door relative to a stationary structure such as a door frame, said device comprising first and second parts for attachment to the movable and stationary structures respectively; one of said parts including a housing and the other part including a member supported by the housing for rotation relative thereto; the housing have therein two working chambers which contain a damping fluid and intercommunicate by way of a constricted opening, the relative volumes of the working chambers varying as the member rotates relative to the housing, and a spring interconnecting the housing and the member and biasing the member in a

pre-determined rotational direction relative to the housing; distortion of the spring during relative rotation of the member



and housing serving to produce the variation in the relative volumes of said chambers.

3,952,366

HINGE DEVICE

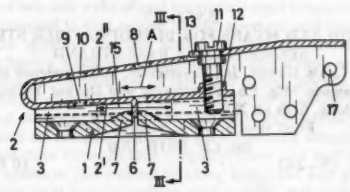
Erich Röck, Hochst, and Bernhard Mages, Dornbirn, both of Austria, assignors to Blum Gesellschaft m.b.H., Hochst, Austria

Filed Feb. 24, 1975, Ser. No. 552,149

Claims priority, application Austria, Feb. 26, 1974, 1567/74; Apr. 2, 1974, 2745/74

Int. Cl.² E05D *7/04*

U.S. Cl. 16—129 **8 Claims**



1. In a hinge device, especially for furniture doors, of the type including at least one mounting plate that can be fixed to one part of a piece of furniture, and a hinge arm which can be anchored directly or indirectly to said mounting plate and which bears swivel arms for connection to another part of a piece of furniture, the improvement wherein:

said mounting plate is provided with at least one centering part means for centering said hinge arm;

said hinge arm is provided with a centering part means for snap fitting engagement into the mounting plate.

3,952,367

STABILIZING HINGE FOR FURNITURE WITH GLASS DOORS

Manfred Schnelle, Hiddenhausen; Ernst Zernig, Hemer, and Jürgen Wilke, Bunde, all of Germany, assignors to Firma Richard Heinze, Herford, Germany

Filed Sept. 19, 1974, Ser. No. 507,513

Claims priority, application Germany, Sept. 20, 1973, 2347290; June 14, 1974, 2428749

Int. Cl.² E04D *15/50*

U.S. Cl. 16—147 **5 Claims**

1. A hinge for pivotally supporting a glass door to a furniture part or the like and comprising:

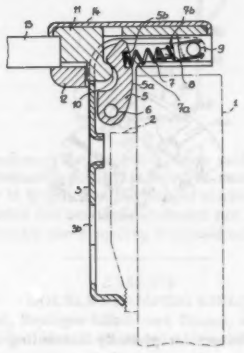
housing means fitting within a mating through aperture in the door,

said housing means defining a peripheral flange which abuts one surface of the door adjacent the recess therein and having clamping means detachably secured thereto for abuting the opposite surface of the door to thereby tightly secure said housing means in said glass door,

a generally L-shaped hinge arm secured to the furniture part and defining a hollow interior portion,

pivot means for pivotally supporting said hinge arm relative to said housing means,

a latch member pivotally supported in said interior portion and spring means also supported within said interior



portion and resiliently urging said latch member in a first direction,

and further means included within said housing means which latchingly engages said latch member when the door is moved to its closed position,

said latch member being movable in an opposite direction against the action of said spring means as the door is moved to and from its closed condition thereby causing said further means to engage said latch member.

3,952,368

HINGES

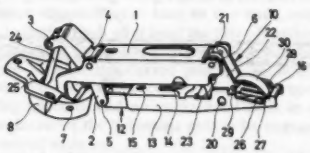
Ernst Zernig, Muhlenweg, D-5870 Hemer, and Manfred Rüther, Friedhofsweg 13, D-5992 Nachrodt, both of Germany

Filed Jan. 9, 1975, Ser. No. 539,829

Claims priority, application Germany, Jan. 16, 1974, 2401915; Feb. 6, 1974, 2405604; Apr. 2, 1974, 2415999

Int. Cl.² E05D *3/06, 15/52*

U.S. Cl. 16—163 **34 Claims**



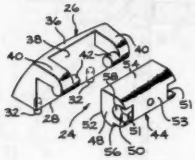
1. A scissor hinge for articulated connection of two components, said hinge comprising (a) a fixing bracket having means operable to fix said hinge to one of the components; (b) a guide lever pivotably mounted at one end to said fixing bracket in the area of a first end of said bracket; (c) two crossed and pivotably joined hinge arms, a first end of the first of said hinge arms being pivotably mounted on said fixing bracket and a first end of the second of said hinge arms being pivotably joined to the second end of said guide lever; (d) fitting means articulately connected to the second ends of said first and second hinge arms and having means operable to fix said fitting means to the second of the components; and (e) spring means operable to urge said hinge to a fully open or fully closed position.

3,952,369

HINGE STRUCTURE

Clifford E. Erickson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Mar. 7, 1975, Ser. No. 556,226
Int. Cl.² E05D 1/06
U.S. Cl. 16—171 6 Claims



1. A hinge structure for pivotally connecting a first and second member at a pivot axis including:

a first hinge portion having a base secured to the first hinged member and having rearwardly extending arms spaced from each other, the arms terminating with laterally extending spaced pivot pins,

a second hinge portion secured to the second hinged member and having a rear wall, top wall, bottom wall, front wall and end walls, both of the end walls having an open-ended recess that is open at the back wall and receives each of the respective pivot pins, the rear wall being adjacent the second hinged member and the second hinged member is a bearing surface for the pivot pins.

3,952,370

LOADING TUBE SLEEVE FOR USE WITH AN ENCASING MACHINE

Charles Austin Greider, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation of Ser. No. 307,057, Nov. 16, 1972, abandoned. This application Jan. 29, 1975, Ser. No. 544,889
Int. Cl.² A22C 11/02
U.S. Cl. 17—41 2 Claims

1. In combination with an encasing machine having a stuffing tube means, comprising,

an elongated loading tube sleeve embracing the stuffing tube means, said loading tube sleeve having a plurality of perforations formed therein,

said loading tube sleeve having a length sufficient to support a folded casing thereon and having an irregular diameter to provide a constantly changing geometry for a tight section of casing as it moves longitudinally along the sleeve,

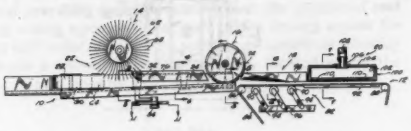
said perforations being arranged on said loading tube sleeve so that said loading tube sleeve has less than a full circumference at any position along the substantial length thereof to reduce the drag imposed on the casing by said loading tube sleeve.

3,952,371

METHOD AND APPARATUS FOR PROCESSING SHRIMP

Robert L. LaPine, 700 1st Ave. North, Wells, Mich. 49894, and Bernard C. Brower, 720 Minnesota Ave., Glastone, Mich. 49837

Division of Ser. No. 326,158, Jan. 24, 1973, Pat. No. 3,867,740. This application Dec. 12, 1974, Ser. No. 531,938
Int. Cl.² A22C 25/18
U.S. Cl. 17—52 6 Claims



1. A method of processing a de-headed but unshelled shrimp comprising the following steps:

a. cutting into the belly of the body of the shrimp to the point at which the alimentary canal of the shrimp is located, said cutting step not extending through the shell of the shrimp so that upon completion of the cutting step the shell thereof will remain intact and will be attached to the body of the shrimp; and

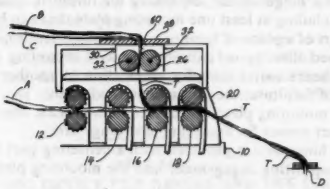
b. spreading the portions of the shrimp on opposite sides of the cut therein to thereby cause the shrimp to assume a substantially flat position with the shell still intact and with the body of the shrimp attached thereto.

3,952,372

METHOD AND MEANS FOR BLENDING FIBER STRAND SEGMENTS IN A BASE STRAND

Robert Lewis Howell, Jr., Fayetteville, N.C., assignor to Holt Williamson Mfg. Co., Fayetteville and Davant Yarns, Inc., Charlotte, both of, N.C.

Filed June 3, 1974, Ser. No. 475,572
Int. Cl.² D01H 5/00
U.S. Cl. 19—243 10 Claims



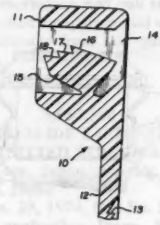
1. A method of adding segments of at least one supplemental strand of fibers of at least one characteristic of color, texture and construction into at least one base strand of fibers of at least one other characteistic of color, texture and construction to produce a composite strand of blended fibers with an unpredictable random distribution of said supplemental strand segments therein, said method comprising separately and continuously advancing said at least one base strand and said at least one supplement strand indiscriminately pulling from said at least one supplemental strand segments of lengths greater than the length of individual fibers thereof and of unpredictably random size and occurrence, adding said pulled supplemental strand segments to said advancing at least one base strand for incorporation therein to form a composite strand, and in advancing said at least one base strand during adding of said pulled supplemental strand segments thereto said at least one base strand is attenuated by drafting.

3,952,373

CABLE BUNDLING STRAP

Peter Noorily, Holliswood, Queens, N.Y., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed Sept. 27, 1974, Ser. No. 509,919
Int. Cl.² B65D 63/00
U.S. Cl. 24—16 PB 4 Claims



1. A self-clinching bundling strap comprising: a head end portion, a tail end portion and an elongated strap body portion therebetween; said strap body portion having a first surface and a second surface and a plurality of teeth extending inwardly from said first surface towards said second surface and terminating short of said second surface to form a third surface, said third surface separated from said second surface by a first predetermined distance; said head end portion having an aperture extending transversely therethrough, the surfaces adjacent said head end portion aperture defining a ceiling, a floor and two side walls of said aperture; a rigid tongue portion rigidly coupled to said ceiling of said aperture and extending into said aperture towards said floor thereof, said tongue portion having a generally rectangular configuration in transverse section, the free end of said rigid tongue portion being separated from said floor of said aperture by a second predetermined distance, smaller than said first predetermined distance; and an elongate stiffening rib originating substantially at the juncture between said tongue portion and said ceiling of said aperture and extending along said head end portion away from said tongue portion and coaxial therewith, said stiffening rib having a width generally equal to the width of said tongue portion; stiffening means on each of said side walls to prevent the stretching of said head end portion; said stiffening rib and said stiffening means cooperating so as to cause said tongue portion and the head end portion above said ceiling to flex as a unit in a first direction about an axis extending along said ceiling of said head end portion aperture away from said strap body portion as said strap body portion is pulled through said head end portion aperture to tighten said strap about a plurality of articles to be bundled, said tongue portion being caused to flex in a second direction opposite said first direction about said axis as a unit with the head end portion above said ceiling towards said strap body portion when pulling on said strap body portion is terminated to lockingly engage said tongue portion with at least one of said teeth and a portion of said third surface therebetween and prevent removal of said strap body portion from said head end portion aperture.

3,952,374

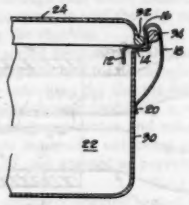
ANTI-SPLATTER CLIP

Victor P. Mohorovich, 2119 46th Ave., San Francisco, Calif. 94116

Filed Dec. 9, 1974, Ser. No. 530,676
Int. Cl.² A44B 21/00; B65D 7/42
U.S. Cl. 24—73 B 6 Claims

1. An anti-splatter clip suitable for use with many different sized cooking pots and lids to prevent steam build-up, comprising:

a. a short run,
b. an inner run extending perpendicular from said short run,
c. a connecting run extending perpendicular from said inner run,



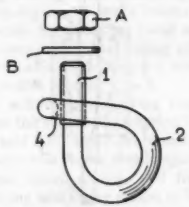
d. an ear-shaped run extending above said connecting run and terminating below said short run, said inner run being greater in length than the parallel distance between said connecting run and said ear-shaped run, and
e. an abutment run extending from said ear-shaped run.

3,952,375

DOUBLE CLAMPING RINGS

Jean Mailliet, Boulogne-Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, both of, France

Filed June 13, 1975, Ser. No. 586,588
Claims priority, application France, June 28, 1974, 74.22623
Int. Cl.² A44B 21/00
U.S. Cl. 24—81 PE 4 Claims



1. A double clamping ring for clamping coaxial or non-coaxial couplings of circular-sectioned or tubular members or members having any other cross-sectional contour, said clamping ring comprising a single piece of metal or non-metallic wire screw-threaded at at least its two ends, and two end sections consisting each of at least the three-fourths of a turn, said end sections being interconnected by a rectilinear or loop-shaped section, the curved junction sections between each partial turn and said rectilinear or loop-shaped section surrounding partially said screw-threaded ends to constitute bearing surfaces for the tightening nuts to be engaged on said screw-threaded ends.

3,952,376

LINE CONNECTING APPARATUS

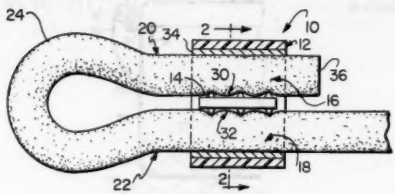
J. Scott Ellis, Rockville, Md., assignor to Ellis Industries, Inc., Gaithersburg, Md.

Filed Jan. 7, 1975, Ser. No. 539,259
Int. Cl.² B65D 63/00; F16G 11/00; A44C 5/18
U.S. Cl. 24—115 A 9 Claims

1. An apparatus for securing two portions of two elongated members together in parallel side by side relationship comprising:

friction means, interposed between adjacent sides of said two portions of said two elongated members, for increasing the friction between said two portions; and

a heat shrinkable tube surrounding said two elongated members at said portions to be secured, said tube adapted to bind said members and said friction means together after being heated,



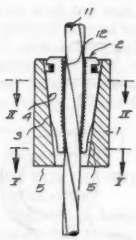
said friction means comprising an elongated body member and a plurality of protuberances extending from the surface of said body member into contact with each of said adjacent sides of said two portions.

3,952,377

CONICAL WEDGES FOR GRIPPING MULTI-PLY ROPE OR CABLE

Juan Coll Morell, Calle Amilcar, 209, Barcelona, Spain

Filed Aug. 19, 1974, Ser. No. 498,612
Claims priority, application Spain, Jan. 25, 1974, 199828
Int. Cl.[2] F16G 11/04
U.S. Cl. 24—136 R 2 Claims



1. A tendon-gripping assembly comprising a tapered wedge for gripping a multi-ply rope or cable, wherein the wedge is circumferentially divided into a plurality of parts surrounding an axial aperture for the rope or cable, each of the said parts having, for at least part of its axial length, opposed inwardly curved side edge portions, and a sleeve for receiving in its interior said parts of said tapered wedge, said sleeve having an inner tapered surface of the same inclination as and engaging exterior surfaces of said wedge parts including regions of said exterior surfaces which are situated between said inwardly curved side edge portions of said wedge parts, the exterior surface regions of said inwardly curved side edge portions of said wedge parts being situated inwardly of and spaced inwardly from the inner surface of said sleeve.

3,952,378

MECHANICAL CLOSURE DEVICE

Carl Dodges, Sparta, and Ernest Petrocco, Dover, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

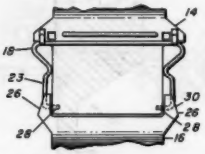
Filed Feb. 4, 1975, Ser. No. 546,955
Int. Cl.[2] A44B 17/00
U.S. Cl. 24—201 LP 8 Claims

1. A device for coupling adjoining member ends which comprises in combination:

a first member end;

a second member end having two fixed jaws for containing said first member end, wherein each of said jaws is provided with a hole therethrough which aligns with a corresponding hole in the first member end when the ends are in coupled position;

a pivotable resilient fastening means having arms terminating in pins, which are pivotably mounted in said jaw holes and extend into said first member holes;



means on each of said jaws adapted to cam and thereby spread the arms of said fastening means when said means is pivoted to cause said pins to be withdrawn from said first member holes; and

means on said first member end adapted to catch said fastening means in coupled position;

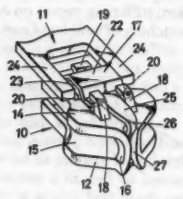
whereby said first and second member ends are coupled when the pins of said pivotable resilient fastening means extend into said holes of the first member end, and are uncoupled when said pins are withdrawn from said holes of the first member end by pivoting said resilient fastening means to engage said cam means.

3,952,379

AUTOMATICALLY LOCKING SLIDER

Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Dec. 20, 1974, Ser. No. 535,103
Claims priority, application Japan, Dec. 29, 1973, 49-4185[U]
Int. Cl.[2] A44F 19/30
U.S. Cl. 24—205.14 R 3 Claims



1. In a slide fastener slider of the type having a single pull tab and a body, said slider body including a top wing and a bottom wing which are interconnected by a web located centrally at its front end to define a generally Y-shaped guide channel therethrough, an automatic lock mechanism comprising, in combination, a locking leaf spring generally arranged longitudinally over said top wing of said slider body and having one end adjacent to and secured to said front end of said slider body in such a manner that said locking leaf spring is yieldably urged against said slider body, said locking leaf spring having a widened portion and an elongate neck extending from said widened portion toward said one end thereof, said widened portion and a portion of said neck adjacent thereto being coplanar, and forming a pair of shoulders at both sides of said neck, a pair of spring retainers projecting upwardly from said top wing of said slider body to engage said shoulders, respectively, of said locking leaf spring so that said

neck of said locking leaf spring is at least partly arranged between said spring retainers, said spring retainers extending over the top surface of said widened portion at said shoulders, and a locking pawl at the other end of said locking leaf spring, said locking pawl normally projecting into said guide channel in said slider body through an aperture formed in said top wing, said locking leaf spring further including a portion between said shoulders and said locking pawl which portion is disposed to enclose a part of said pull tab in such a manner that when a pull is exerted on said pull tab, said locking leaf spring is generally raised away from said slider body whereby said locking pawl retracts from said guide channel in said slider body.

3,952,380

CONCEALED SLIDE FASTENER HAVING WARP-KNITTED STRINGER TAPES

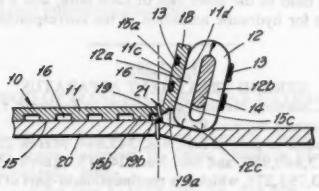
Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Oct. 29, 1974, Ser. No. 518,632

Claims priority, application Japan, Nov. 9, 1973, 48-130074[U]

Int. Cl.² A44B 19/12, 19/40

U.S. Cl. 24—205.13 C **2 Claims**



1. A concealed slide fastener comprising a pair of opposed stringer tapes carrying respective rows of fastener elements, each of said stringer tapes having a longitudinal extending marginal edge portion to which a corresponding row of fastener elements is secured, a web portion, and a longitudinal extending flexing portion connecting said marginal edge and web portions and defining a longitudinal axis of fold to accommodate folding of the tape along said axis into a configuration in which part of the web portion overlaps the marginal edge portion, said web portion having a plurality of longitudinally extending alternate wales and grooves all on one side of the tape, and said edge portion having a generally flat surface on said one side of the tape, said flat surface being in contact with said row of fastener elements, said edge portion having a plurality of longitudinally extending alternate wales and grooves all on the opposite side of the tape, said flexing portion having a surface recessed in relation to the flat surface of the edge portion to accommodate folding the tape into said configuration with the edge portion and said part of the web portion facing each other on said opposite side of the tape and without interfering abutment between wales of said portions.

3,952,381

BUCKLE FOR RETARDED AUTOMATIC UNLOCKING OF SAFETY BELTS AND HARNESSES OF PARACHUTING EQUIPMENT AND OF VEHICLES

Guy Barbe, Marseille, France, assignor to Etudes et Fabrications Aeronautiques, Paris, France

Filed Sept. 20, 1974, Ser. No. 507,874

Int. Cl.² B64D 17/38

U.S. Cl. 24—230 A **16 Claims**

1. A buckle for retarded automatic unlocking the shackle of safety belts and harnesses, said buckle comprising:

a casing for receiving the shackle;

a frame means slideably mounted with respect to said casing and including a frame means return spring connected to said casing for biasing said frame means to an initial position;

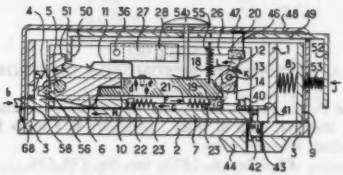
a shaft mounted through said frame means;

a bolt rotatably mounted on said shaft for releasably engaging and locking the shackle;

an automatic unlocking control rotatably mounted on said shaft and engaging said bolt for disengaging said bolt from the shackle for unlocking the shackle from said bolt;

an auxiliary locking means including a movable means supported by said frame means and releasably engaging and locking said automatic unlocking control so as to block rotation of said control to prevent unlocking the shackle from said bolt;

at least one drive spring, connected to said movable means, compressed by the shackle when the shackle is inserted into said casing and biasing said movable means for



movement out of engagement with said automatic unlocking control for unlocking said automatic unlocking control

said auxiliary locking means further including a movable latch means withdrawably abutting said movable means for securing said movable means against the biasing of said drive spring and a brake means connected to said movable means for retarding rapid acceleration of said movable means under the urging of said drive spring when said movable latch means is withdrawn from abutting said movable means;

whereby said automatic unlocking control is slowly unlocked under the action of a traction force exerted by the shackle on said bolt, which traction force is sufficient to slideably move said frame means against the bias of said frame means return spring, said frame means return spring returning said frame means to its initial position as soon as the traction force of the shackle on said bolt substantially diminishes.

3,952,382

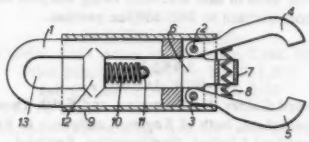
RAPID RELEASE HOOK

Einar Vaage, Vestfossen, Norway, assignor to Einar Vaage, Vestfossen, Norway

Filed July 22, 1974, Ser. No. 490,283

Int. Cl.² A44B 13/02

U.S. Cl. 24—241 PS **2 Claims**



1. A rapid-release hook comprising a U-shaped member having two substantially parallel legs, a pair of cooperating bail members, one of said bail members being pivoted to the outer end of one of the legs of said U-shaped member, the other of said pair of bail members being pivoted to the outer end of the other leg of said U-shaped member, each of said

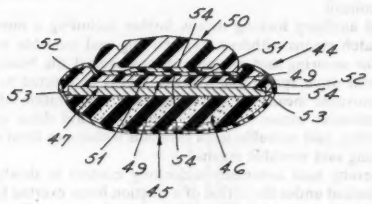
bail members being pivotable between an open and a closed position, said bail members when in the closed position defining a second U-shaped member of substantially the same thickness and of substantially the same lateral dimension as said first U-shaped member and defining therewith a flat oval link, a sleeve, said sleeve slidingly embracing said flat oval link, one end of said sleeve extending about the opening in said second U-shaped member when said bail members are closed to form said second U-shaped member, said sleeve being slideable longitudinally of said oval link from a first position to a second position to open and close said bail members, a spring between said bail members urging said bail members to the open position, a bridge between the legs of said first U-shaped member, a second spring being secured at one end to, within and laterally confined by said sleeve and bearing at its other end against said bridge to urge said sleeve towards said second position to close said bail members, and in the closed position of said bail members said sleeve comprising the largest lateral dimension of said rapid-release hook.

3,952,383

STRAP FITTING FOR AUTOMOBILE INTERIOR AND OTHER USES

Ronald D. Moore, Grosse Pointe, and Everett L. Bethel, Sterling Heights, both of Mich., assignors to Chivas Products Limited, Warren, Mich.

Filed Jan. 6, 1975, Ser. No. 538,538
Int. Cl.² A47B 95/02; B60J 7/20
U.S. Cl. 24—265 R **26 Claims**



1. A strap construction for mounting on and across at least a portion of a panel or like surface, comprising an assembly of an elongated base strip, a cushion strip of a relatively shorter length than said base strip disposed lengthwise along said base strip on the side of the assembly to face said surface portion as the strap construction is mounted thereto, and a facing strip slightly longer than said cushion strip but shorter than said base strip wrapped around said base and cushion strips, said facing strip having longitudinal edge members adjacent one another which extend along the side of said assembly opposite the side on which the cushion strip is disposed thus to face away from said surface portion, said longitudinal edges and elongated base strip being secured by suitable bonding means to prevent shifting of said facing strip relative to said base strip, and the ends of said assembly being adapted to connect the strap construction to said surface portion.

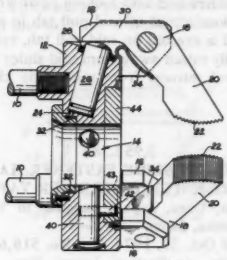
3,952,384

PIPE JACKS

Philip Edward Goldry, Northampton, and Keith Thomas Skinner, Birmingham, both of England, assignors to Kelly Bros. (Northampton) Limited, Northampton, England

Filed Oct. 7, 1974, Ser. No. 512,501
Claims priority, application United Kingdom, Nov. 21, 1973, 53954/73
Int. Cl.² E21B 19/00
U.S. Cl. 24—249 HA **5 Claims**

1. An annular pass-through gripping head for a pipe jack, having minimal axial length to permit the head to be reciprocated with a maximum stroke, comprising a flat annular block having a central aperture adapted to surround a pipe, a plurality of jaws, each of which is pivoted to the block so as to swing substantially in a plane radial to the axis of said aperture, and each of which terminates in a pipe-gripping face, wherein the improvement comprises an arm integral with each jaw, which



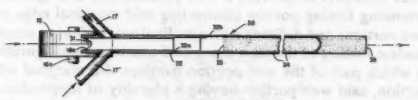
extends along the periphery of the block and is substantially parallel to said axis, a bore extending into the periphery of the block in a generally radial direction in alignment with each such arm, a passage in the block which is connected to supply hydraulic fluid to the inner end of each bore, and a piston in each bore for hydraulic actuation of the corresponding jaw.

3,952,385

STRAND TREATMENT APPARATUS

Robert K. Stanley, Media, Pa., assignor to Textured Yarn Co., Inc., Kennett Square, Pa.

Continuation-in-part of Ser. Nos. 343,644, March 22, 1973, Pat. No. 3,840,950, and Ser. No. 124,213, March 15, 1971, Pat. No. 3,753,275, which is a continuation-in-part of Ser. No. 822,429, May 7, 1969, Pat. No. 3,570,083, which is a continuation-in-part of Ser. No. 678,428, Oct. 26, 1967, Pat. No. 3,462,814, and Ser. No. 302,758, July 31, 1963, Pat. No. 3,376,622. This application July 5, 1973, Ser. No. 376,890
Int. Cl.² D02G 1/20, 1/16, 1/12
U.S. Cl. 28—1.3 **3 Claims**



1. Apparatus for crimping textile strands, comprising nip roll feed means for engaging a textile strand and feeding it into stuffing chamber means located downstream of the roll means for laterally confining the textile strand temporarily, a plurality of jet means flanked at least in part by the roll means at the entrance end of the chamber for applying fluid obliquely in the downstream direction to the strand, and a screen surrounding the strand laterally at the exit end of the chamber.

3,952,386

APPARATUS FOR INTERLACING STRANDS OF A TEXTILE YARN

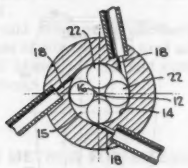
Jean Joly, Craponne, and Silvio Sangalli, Caluire, both of France, assignors to Rhone-Poulenc-Textile, Paris, France

Division of Ser. No. 363,561, May 24, 1973, Pat. No. 3,889,327. This application Dec. 5, 1974, Ser. No. 529,906
Claims priority, application France, May 26, 1972, 72.19404
Int. Cl.² D02G 1/16
U.S. Cl. 28—1.4 **6 Claims**

1. Apparatus for interlacing strands of a textile yarn comprising:

a housing defining a cylindrical interlacing chamber for passage of the textile yarn axially therethrough;

means for introducing a fluid current into said interlacing chamber for treating the yarn, including at least a nozzle disposed to direct a fluid current non-radially into said interlacing chamber;



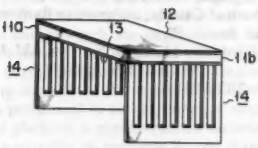
disturbing means including at least one element movably disposed in said interlacing chamber and movably by the fluid current, for disturbing the fluid current introduced into said interlacing chamber.

3,952,387

METHOD OF MANUFACTURING AN ULTRASONIC PROBE

Kazuhiro Iinuma, Yokohama, and Einoshin Itamura, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed July 1, 1974, Ser. No. 484,929
Claims priority, application Japan, July 3, 1973, 48-75152
Int. Cl.² H01L 41/22
U.S. Cl. 29—25.35 **6 Claims**



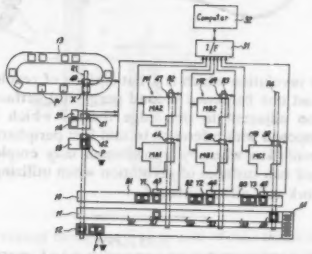
1. A method of manufacturing an ultrasonic probe which comprises the steps of forming mutually insulated first and second metal electrode layers on both surfaces of a plate-shaped piezoelectric vibrator; brazing to each of the first and second metal electrode layers a common connection section of a slitted metal plate to which a plurality of leads are jointly connected at least at one end; bonding an ultrasonic absorber to substantially the whole surface of one of said first and second metal electrode layers; cutting through the first and second metal electrode layers, the piezoelectric and the brazed common connection section of the slitted metal plate all assembled together at prescribed intervals, such that each cut element of the piezoelectric vibrator contains one pair of leads, thereby producing an array of a plurality of independently operative piezoelectric vibrator elements arranged on the ultrasonic absorber in a substantially flush relationship and provided with an ultrasonic wave-emitting surface.

3,952,388

MACHINE TOOL APPARATUS

Kazuhiko Hasegawa, Toyota; Yoshio Shima, Obu, and Shigeo Noda, Nagoya, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha and Toyota Jidosha Kogyo Kabushiki Kaisha, both of, Japan

Filed July 22, 1974, Ser. No. 490,364
Claims priority, application Japan, July 24, 1973, 48-83397
Int. Cl.² B23Q 7/00
U.S. Cl. 29—33 P **10 Claims**



1. Machine tool apparatus for handling routine pallets and priority pallets with loading and unloading stations comprising:

a plurality of machine tools for performing machining operations on a workpiece mounted on a pallet;

main conveyer means for carrying a pallet in one direction;

buffer conveyer means for storing a pallet to be loaded onto a machine tool;

return conveyer means for returning a pallet to an unloading station;

pallet transfer means for moving a pallet among the conveyer means, the stations and the machine tools;

central control means for controlling the machine tools and the conveyer means comprising:

means to discriminate a priority pallet from a routine pallet mounted on a machine tool or a loading station;

means to reserve a machine tool onto which a priority pallet is to be loaded to prohibit use of said machine tool with respect to a routine pallet;

means to control the pallet transfer means to carry a priority pallet from the main conveyer means to one of the machine tools;

means to control the pallet transfer means to move a routine pallet from the main conveyer means to the buffer conveyer means;

means to control the pallet transfer means to move a routine pallet from the buffer conveyer means to one of the machine tools when the machine tool on which the routine pallet is to be loaded is not reserved by a priority pallet and is not occupied by another pallet.

3,952,389

BURNISHING TOOL

Carl L. Corder, 1351 Acton St., Berkeley, Calif. 94710

Filed Feb. 20, 1975, Ser. No. 551,371
Int. Cl.² B21C 37/30; B21D 9/08
U.S. Cl. 29—90 R **7 Claims**

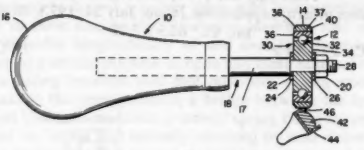
1. A hand-held burnishing tool for working soft metals comprising:

an elongated cylindrical handle means capable of being manually held;

a shaft means having one end fixedly retained in said handle means and the other end projecting therefrom, said shaft means having its longitudinal axis generally aligned with the longitudinal axis of said elongated cylindrical handle means;

bearing means mounted on the distal end of the projecting end of said shaft means; and

a cylindrical shaped burnishing wheel rotatably mounted on said bearing means so its axis of rotation is coaxial with the longitudinal axis of said shaft means, said burnishing wheel having a hardened first peripheral central surface



or revolution which is a flat surface of revolution and at least one hardened second peripheral surface of revolution adjacent to one edge thereof which is angularly disposed with reference to said first peripheral surface of revolution whereby a craftsman may employ either of said two surfaces of revolution when utilizing the tool to work soft metal surfaces.

3,952,390

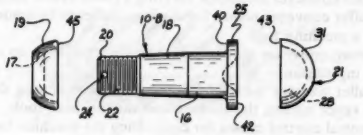
METHOD OF PRODUCING BALL JOINTS

James J. Amos, 568 Hyatts Road, Delaware, Ohio 43015

Division of Ser. No. 337,154, March 1, 1973, Pat. No. 3,831,244. This application Mar. 27, 1974, Ser. No. 455,055

Int. Cl.² B21D *53/10*

U.S. Cl. 29—149.5 B **2 Claims**



1. The method of making ball studs for pivot joints comprising, in combination, forming a shank portion by heading a work-piece to provide an enlarged head portion provided with an outwardly convex generally spherical surface and an inwardly facing junction forming surface; forming a second head portion from a second work-piece provided with a generally spherical outer surface, a second inwardly facing junction forming surface, and a central bore; assembling said first and second work-pieces by extending said shank through said bore with said junction forming surfaces in confronting relationship; welding said first and second head portions together at said confronting junction forming surfaces to provide a fused junction; and machining said junction and bearing surfaces to provide a finished bearing head of substantially spherical contour.

3,952,391

TURBINE BLADE WITH CONFIGURED STALK

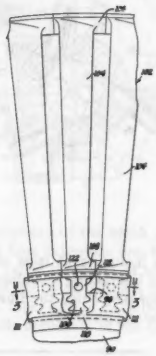
Ted F. Gee, Greenwood, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 22, 1974, Ser. No. 489,606

Int. Cl.³ B23P *15/00*, *15/02*

U.S. Cl. 29—156.8 R **1 Claim**

1. A method for preventing average tangential stress buildup in a gas turbine engine rotor wheel having a ring of turbine blades supported thereon each having a dovetail configured root fit in a dovetail blade slot in the peripheral rim of the wheel and wherein each blade includes a stalk portion with end walls and parallel side walls comprising the steps of selecting a blade material having a high tensile strength and with material strength development under operating conditions not to exceed 1.5 standard deviations from a statistical mean strength, selecting a rotor wheel material having a high tensile strength and with material strength reduction not to exceed 3.3 standard deviations from a statistical mean strength, machining all peripheral walls of said stalk to establish a controlled rectangular area therethrough, drilling and reaming a circular hole through said stalk area with an inner surface parallel to and bounded by the side walls, chemically machining said hole surface to eliminate stress risers therein thereby



to define a critical separation section, and locating the stalk at a point radially outwardly of the rim so that the pre-treated hole and bounding parallel side walls of said stalk are unsupported therein to assure that at least 60 percent of the blades will separate at the hole prior to the average tangential stress of said wheel reaching 90 percent of the ultimate tensile strength of said wheel with the blade separation serving to reduce the speed of the wheel.

3,952,392

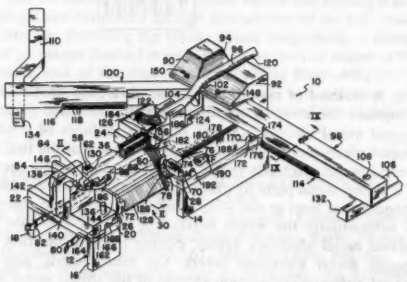
FIELD TERMINATION TOOL HAVING CONNECTOR REFERENCE PLANE APPARATUS AND HINGED INSERTION ARMS

John Peter Nijman, West Hill, and Terence Neil Patterson, Toronto, both of Canada, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Jan. 11, 1974, Ser. No. 432,484

Int. Cl.² H01R *43/04*

U.S. Cl. 29—203 MW **20 Claims**



1. Apparatus for terminating a plurality of free-ended insulated electrical conductors in respective contact portions of contacts mounted in an electrical connector, comprising:

connector support means for supporting an electrical connector;

a pair of cutting members on opposite sides of said connector support means, each of said cutting members having a cutting edge;

a pair of arms mounted for movement toward respective sides of the supported connector, each of said arms carrying a plurality of insertion blades for engaging and pressing individual conductors into respective contact portions, each of said insertion blades including a cutting edge which is cooperable with a cutting edge of a respective cutting member to sever a corresponding conductor immediately prior to insertion into the respective contact portions; and

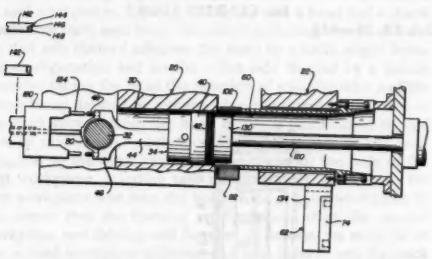
means urging said arms perpendicularly with respect to their directions of movement to urge said cutting edges of said insertion blades toward said cutting edges of said cutting members.

3,952,393

MACHINE AND METHOD FOR ASSEMBLING PISTONS INTO ENGINES

Jacob van Ravenzwaay, Richmond Hill; Larry Ord, Orton, and Norman Nicol, Richmond Hill, all of Canada, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 30, 1974, Ser. No. 522,237
Claims priority, application Canada, Jan. 17, 1974, 190424
Int. Cl.² B23P *19/04*
U.S. Cl. 29—208 R **10 Claims**



1. A multiple station automatic assembly apparatus for inserting piston sub-assemblies into the bores of a piston engine block in which each piston sub-assembly includes a piston member with piston rings and a connecting rod with the remote end of said rod having one portion of a split bearing affixed thereat and in which the engine block has its crankshaft assembled thereon, the apparatus comprising a platform for holding an engine block on end with the engine crankshaft extending along one side of the engine block with the engine cylinder bores positioned in an alignment, a magazine block resting on said platform a predetermined distance from said engine block, a plurality of openings in said magazine block, a tubular member in each opening adapted to hold a piston sub-assembly axially alignable with a cylinder bore, means at certain of said stations for advancing selected pistons from respective tubular members into bores of said cylinder block, and means at said certain stations movable into the cylinder bores for receiving the bearing portion of a piston sub-assembly being advanced to carry the bearing portion of the piston sub-assembly onto the crankshaft.

3,952,394

VALVE CORE EXTRACTION TOOL

Ezekiel Seminario, 15500 Tustin Village Way, Tustin, Calif. 92680

Filed Oct. 4, 1974, Ser. No. 512,171
Int. Cl.² B25P *19/04*
U.S. Cl. 29—263 **12 Claims**

1. An extraction tool for extracting valve cores and sleeves from valves, comprising in combination:

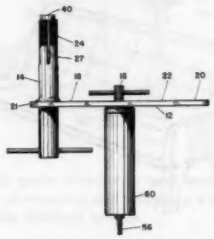
a base;

expansible means in the form of an expansible member carried by said base for insertion into a valve sleeve;

expanding means carried by said base for expanding said expandable member;

connecting means for completing a connection to a valve core;

a threaded rod having threaded connection to said base at a point removed from said expansible means, said con-



necting means being fixed to an end of said threaded rod such that said connecting means is moved to change its distance from said base as an incident to rotation of the rod relative to the base on the axis of the rod; and

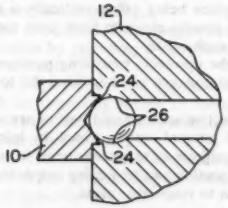
spacer means in the form of a cylinder disposed over said rod with one end abutting said base for engaging a valve body and maintaining said base at a given distance from said valve body whereby rotation of the rod will result in movement of valve core to which said connecting means is connected relative to said valve body.

3,952,395

METHOD OF CLOSING THE END OF A DRILLED PASSAGE

Richard L. Crossman, Tallmadge, and Harold E. Correll, Uniontown, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 30, 1974, Ser. No. 537,070
Int. Cl.² B22D *19/10*; B23P *7/00*
U.S. Cl. 29—401 C **6 Claims**



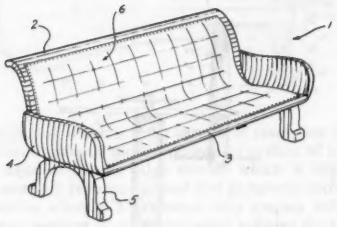
1. A method for plugging holes in a work piece utilizing a spherical ball which includes the steps of:

1. preparing the work piece from a ductile metallic material,
2. preparing a uniform diameter to the hole in the work piece with an outward taper at the end thereof to the surface of the work piece thereby defining a larger diameter at the surface equal to the outer diameter of the ball to initially receive and align the ball with the hole,
3. preparing the ball from the same metallic material as the work piece,
4. pressing the ball into the hole to define a continuous line contact with the inner surface of the hole so that it is about flush to the outer face of the work piece, and
5. holding the ball into such press-fit relationship with the hole.

3,952,396
METHOD FOR FABRICATING A SOFA

Harvey Albert Werner, 6531 Kessler Ave., Woodland Hills, Calif. 91364

Filed May 23, 1975, Ser. No. 580,361
Int. Cl.² B23P 17/00
U.S. Cl. 29—416 6 Claims



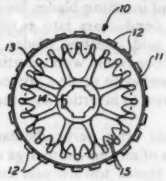
1. A method for fabricating a sofa comprising:
providing a pair of spaced apart leg members;
constructing an integral seat and back by:
providing a form having spaced apart members, each of said end members having an edge extending to form a generally L-shaped contour,
placing boards having a quadrilateral cross section on said edges to span the space between said end members,
joining abuting sides of said boards to form a surface having an upwardly extending back portion and a generally horizontally extending seat portion;
joining the underside of said seat portion to the top of said pair of leg members, whereby said integral seat and back are supported by said pair of leg members;
constructing a pair of arms for said sofa by:
providing a generally rectangular block of wood,
forming mating curved surfaces by cutting through said block to form a convex piece and a mating concave piece,
joining the planar sides opposite said curved surface of each piece to each other so that said curved surfaces on the pieces face outwardly in opposite directions, said concave piece being offset vertically a short distance from said convex piece to form joint surfaces at right angles to each other,
cutting off the upwardly extending portion of said vertically offset concave piece to form the top of said arm; and
fastening respective arms of said pair of arms to respective ends of said integral seat and back by joining said right angle joint surfaces of respective arms to respective ends of said seat portion and by joining respective ends of said back portion to respective arms.

3,952,397
METHOD FOR FORMING A PRINT WHEEL WITH METAL RIM

Joseph B. Lohr, Wayne, N.J., assignor to Litton Business Systems, Inc., Pinebrook, N.J.

Filed June 17, 1974, Ser. No. 479,852
Int. Cl.² B23P 17/00
U.S. Cl. 29—421 R 6 Claims

1. A method of forming a print wheel having a rim bearing characters comprising the steps of:
positioning a blank member in a die assembly containing the characters to be formed on the print wheel;
forcing fluid material against said blank member to urge said member against the characters in said assembly to thereby deform said member to assume the configuration of said characters;
allowing said fluid material to harden;

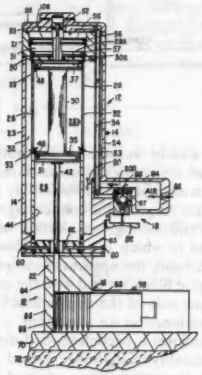


and removing the finished print wheel from said die assembly.

3,952,398
PROCESS FOR PNEUMATICALLY IMPELLING A HAMMER TO DRIVE A NAIL INTO A SUBSTRATE

Harry M. Haytayan, Sunnyside Lane, Lincoln, Mass. 01773

Division of Ser. No. 312,665, Dec. 6, 1972, abandoned, which is a continuation-in-part of Ser. No. 68,423, Aug. 31, 1970, Pat. No. 3,711,008. This application Aug. 12, 1974, Ser. No. 496,693
Int. Cl.² B23P 11/00
U.S. Cl. 29—432 2 Claims



1. A process for driving a pneumatic hammer to drive a sharp, pre-selected and pre-positioned nail into a preselected substrate comprising metal or concrete, said process comprising the steps of:
1. driving said hammer by means of a pneumatically-operated piston through a drive stroke without transferring energy from said drive stroke to a spring;
2. providing a continuous supply of motivating air to said piston and valving said air supply so as to increase the acceleration of the hammer throughout the major portion of said drive stroke; and
3. driving the nail into the substrate with said hammer on said drive stroke after said hammer has travelled along said drive stroke for a distance at least as long as the length of said nail.

3,952,399

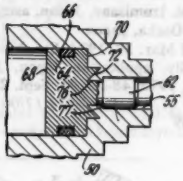
UNITING TWO ELEMENTS

Robert H. Sawyer, Bernardsville, N.J., assignor to Cartridge Actuated Devices, Inc., Fairfield, N.J.

Division of Ser. No. 381,321, July 20, 1973, Pat. No. 3,896,621, which is a continuation-in-part of Ser. No. 230,837, March 1, 1972, Pat. No. 3,748,413. This application June 28, 1974, Ser. No. 483,995

Int. Cl.² B23P *11/00*

U.S. Cl. 29—432 3 Claims



1. A fastening method which comprises forming registering holes in two workpieces to be united, the hole in a first of said workpieces being of greater diameter than that in the second of said workpieces, forming a fastener with a head and a shank projecting from said head, the shank including a neck defined on that side thereof adjacent the head by a knife edged forming configuration and on the other side thereof by a square shoulder facing the head the junction of said shoulder and the shank being defined by a sharp edge, the shank on that side of the neck remote from the head having a diameter to fit said hole in said second workpiece and on that side of the neck adjacent to the head having a diameter to fit the hole of the first workpiece, inserting said shank through the hole in the first workpiece and into the hole of the second workpiece to the extent that the forming configuration abuts the second workpiece and driving said fastener to deform the material of the second workpiece adjacent the hole therein into the neck of the shank and to cause the head to abut said first workpiece, the head and material deformed into said neck holding said workpieces together and said sharp edge preventing the separation of the two workpieces other than by shearing the material deformed into said neck at said sharp edge.

3,952,400

METHODS FOR CUTTING ALIGNED NOTCHES IN PARALLEL WOODEN FRAME MEMBERS

Hans J. Wowczyk, 2 N. Atlas Ave., Thousand Oaks, Calif. 91360

Division of Ser. No. 492,404, July 29, 1974. This application Mar. 13, 1975, Ser. No. 558,062

Int. Cl.² B21D *39/03;* B23P *11/00*

U.S. Cl. 29—432 2 Claims

1. The method that comprises:

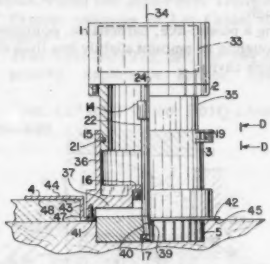
positioning a series of boards in parallel relation with outer similar faces of said boards lying in a common plane;

temporarily connecting an elongated guide member to said boards in a position of extension across said outer faces thereof in close proximity to said faces;

moving a portable power driven cutting tool into engagement with said guide member and directing said tool along a path parallel to said guide member and across said faces of the boards by engagement with the guide member;

cutting aligned similar notches of predetermined cross section in said series of boards by said tool as the latter is advanced along said guide member;

removing said guide member from said position of extension across said outer faces of said boards; and



connecting said guide member to said boards in a position of extension thereacross and reception within said similar notches of the different boards.

3,952,401

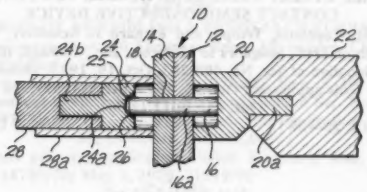
PROCESS FOR INSTALLING FATIGUE-RATED RIVETS

David Lee Wagner, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed June 30, 1975, Ser. No. 591,971

Int. Cl.² B21D *39/00;* B23P *11/02*

U.S. Cl. 29—522 4 Claims



1. A method of forming an interference fit between a rivet shank and the perimeter of an aperture through which the rivet shank is inserted comprising:

preventing the rivet shank from longitudinal movement in a first direction by providing an obstruction adjacent to a first end thereof;

upsetting in a single impact the opposite end of the rivet shank with an impacting means to thereby radially expand the rivet shank against the perimeter of the aperture to compression stress same;

preventing the rivet shank from longitudinal movement in a second direction by providing an obstruction adjacent to the upset opposite end; and

upsetting in a single impact the first end of the rivet shank with an impacting means to thereby radially expand the rivet shank against the perimeter of the aperture to compression stress same.

3,952,402

COMPOSITE STRUCTURAL PANEL AND PROCESS OF MAKING

Max Mengeringhausen, Wurzburg, Germany, assignor to Mero AG, Wurzburg, Germany

Continuation-in-part of Ser. No. 111,820, Feb. 2, 1971, abandoned. This application Feb. 8, 1974, Ser. No. 440,762

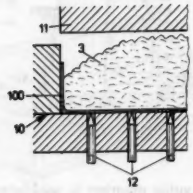
Int. Cl.² B22D *11/126*

U.S. Cl. 29—527.1 3 Claims

1. A process for the production of a self-supporting composite structural panel comprising,

a. preforming a thin-walled large area, open top metallic trough having a depth substantially the thickness of the panel to be produced and having openings in the bottom of the trough;

b. introducing a plastic-like, hardenable, pourable material into the trough in an amount slightly less than the volume of the trough cavity;



c. extending impressing tools into the material through the openings in the bottom of the trough and then retracting the impressing tools therefrom while the pourable material is being hardened, to thereby form cavities in the pourable material to obtain the desired volume; and

d. allowing the pourable material to harden within the trough in such a manner that it forms a composite with the trough, whereby the trough becomes an externally disposed reinforcement for the panel.

3,952,403

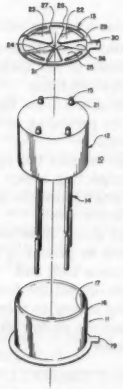
SHELL EYELET AXIAL LEAD HEADER FOR PLANAR CONTACT SEMICONDUCTIVE DEVICE

Ben H. Copeland, Tempe, and Richard L. Schaffert, Mesa, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 408,203, Oct. 19, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,726

Int. Cl.² B01J *17/00*

U.S. Cl. 29—588 **7 Claims**



1. A method for electrically contacting a multiple bonding pad led frame, said multiple bonding pads being attached to an exterior supporting ring, to terminal leads of an axial led header, comprising the steps of:

disposing said multiple bonding pad lead frame within a flat supporting member;

placing a supporting base onto said bonding pad lead frame, said supporting base having a shell eyelet, a glass preform disposed interiorly of said shell eyelet, and said terminal leads disposed within and extending therethrough to the bonding surface of said glass preform;

bonding said multiple bonding pads to said terminal leads, said glass preform being softened during said bonding step for sealing said terminal leads interiorly of and to said shell eyelet with said glass preform being simultaneously bonded at the surface thereof to said multiple bonding pads; and

removing said circular supporting ring for electrically isolating said bonding pads from each other.

3,952,404

BEAM LEAD FORMATION METHOD

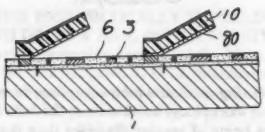
Mituo Matunami, Izumisano, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Mar. 29, 1974, Ser. No. 456,269

Claims priority, application Japan, July 30, 1973, 48-85651; July 31, 1973, 48-86500; Sept. 25, 1973, 48-108829

Int. Cl.² B01J *17/00*

U.S. Cl. 29—589 **10 Claims**



1. A method of making semiconductor devices having a predetermined number of beam leads for electrical connections to external terminals, said method comprising the steps of:

preparing a semiconductor wafer including one or more circuit elements thereon;

forming a predetermined number of electrode pads to which the corresponding beam leads are connected;

depositing over the surface of the semiconductor wafer except the electrode pads an undercoating metal film which does not adhere strongly to the wafer surface;

forming in a desired pattern a metal film which adheres closely to the electrode pads and the undercoating metal film and forms the aforementioned beam leads;

applying physical force to the semiconductor wafer in order to cause the undercoating metal film to be spaced away from the surface; and

dividing the semiconductor wafer into a plurality of semiconductor devices.

3,952,405

METHOD FOR FABRICATING A LIQUID CRYSTAL DISPLAY

Clovis R. Vest, Phoenix, Ariz., assignor to Motorola, Inc., Chicago, Ill.

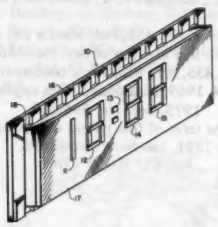
Filed Nov. 4, 1974, Ser. No. 520,598

Int. Cl.² G02F *1/13*

U.S. Cl. 29—592 **10 Claims**

1. A method for fabricating a liquid crystal display device comprising the steps of providing a pair of insulated electrode-carrying plates, depositing on the surface of one of the plates, overlying the electrodes, a layer of photopolymeric material approximately 0.0005 inches in thickness, masking and light exposing the photopolymeric layer and thereafter developing away with a suitable solvent a predetermined area of material to provide a cavity in the photopolymeric layer through which the electrodes on the plate are accessible, depositing on the surface of the second one of the plates whereat the second set of electrodes are located a layer of photopolymeric material of approximately 0.0005 inches in thickness, masking and light exposing the second photopolymeric material and thereafter developing away with a suitable solvent a predetermined area of material which is slightly smaller than the area provided by the first area of material to provide a cavity in the

photopolymeric layer through which the electrodes on the second plate are accessible, bonding the first and second



electrode-carrying plates together to seal the edges of the cavity, and filling the cavity with a liquid crystal composition.

3,952,406

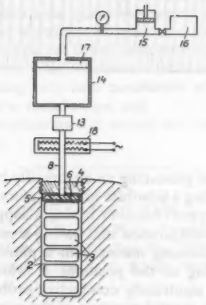
METHOD OF SECURING THE ROTOR WINDING OF A TURBO-GENERATOR ROTOR

Kristian Dahl Madsen, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Division of Ser. No. 448,367, March 5, 1975. This application July 14, 1975, Ser. No. 595,620

Int. Cl.² H02K *15/14*

U.S. Cl. 29—598 **2 Claims**



1. Method of manufacturing a turbo-generator rotor provided with a plurality of rotor slots, comprising a rotor winding in the slots, means securing the winding in the slots, a plurality of axially and consecutively arranged slot wedges (4) of a material of high electrical conductivity, a plurality of slot wedges (4) lying in the same slot, which comprises inserting a pressure tube (5) of a plastically deformable metal, sealed at the ends and furnished with a radially oriented filling tube (8), in a winding slot of a turbo-generator rotor, arranging a plurality of metallic slot wedges (4) at the top of each slot outside said tube, said filling tube projecting radially between two of said slot wedges, connecting said filling tube (8) to a pressure container (14), injecting a thermosetting resin from the pressure container into the pressure tube with a pressure in the range of 200–800 bar and in sufficient quantity to increase the pressure tube volume by at least 50 percent, mainly by means of plastic deformation of the tube material, elastic deformation being restricted to the initial stage of expansion and constituting at the most 15 percent of the total deformation, and allowing the injected thermosetting resin to solidify under pressure.

3,952,407

METHOD FOR THE MANUFACTURE OF WAVEGUIDE

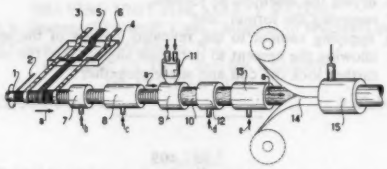
Marcel Aupoix, Paris, and Jean-Pierre Trezeguet, Venissieux, both of France, assignors to Les Cables de Lyon, Lyon Cedex, France

Filed Apr. 18, 1975, Ser. No. 569,428

Claims priority, application France, Apr. 25, 1974, 74.14461

Int. Cl.² H01P *11/00*; H01Q *13/00*

U.S. Cl. 29—600 **4 Claims**



1. A method for manufacturing a wave guide comprising the steps of:

forming a hollow conductor;

arranging, round the hollow conductor, layers of porous dielectric or conductive materials previously impregnated with a mixture of phenolic resin with an isocyanate;

spraying on said layers to cause the hardening of the isocure resin an amine carried by a gas current; and

removing any excess amine.

3,952,408

METHOD OF ASSEMBLING A RESISTANCE FURNACE

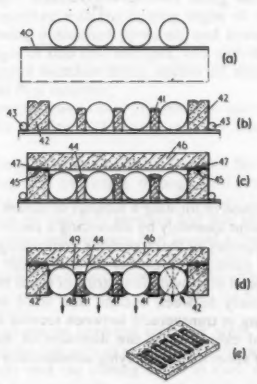
Albert George Docx, 70 Ellesmere Road, Altrincham, Cheshire, England

Continuation-in-part of Ser. No. 286,336, Sept. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 123,807, March 12, 1971, abandoned. This application July 30, 1974, Ser. No. 493,642

Claims priority, application United Kingdom, Mar. 26, 1970, 14789/70; May 2, 1970, 21219/70

Int. Cl.² H05B *3/18*

U.S. Cl. 29—611 **2 Claims**



1. A method of producing a muffle and muffle section in which an electric heating element is temporarily supported in a desired position and ceramic fibers are applied to the supported electrical heating element to form a support for the electric heating element, comprising the steps of:

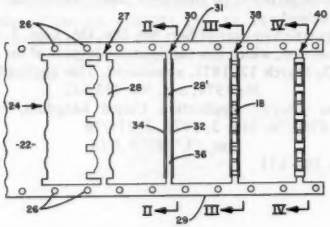
a. winding a prepared spiral heating element around a former with a ceramic fiber spacer between each turn of the coil so formed,
b. placing ceramic fiber end pads at the ends of the former so as to grip the coil and spacers lightly together,
c. applying cement formed of chopped ceramic fibers and a liquid rigidizer to the exposed top of the spacer allowing it to permeate slightly into the coil to lock the coil and spacer together,
d. passing a tube of ceramic fiber over the coil and spacer assembly and cementing the tube to the end pads,
e. drying the assembly so formed,
f. removing the former, and
g. applying cement to the revealed surface of the spacer allowing the cement to permeate slightly into the coil to further lock the coil and spacer together.

3,952,409

METHOD OF MANUFACTURE OF ELECTRIC HEATING ASSEMBLY

William L. Allison, Strawberry Plains, and Donald E. Alexander, Knoxville, both of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed June 30, 1975, Ser. No. 591,976
Int. Cl.² H05B *3/00*
U.S. Cl. 29—611 **3 Claims**



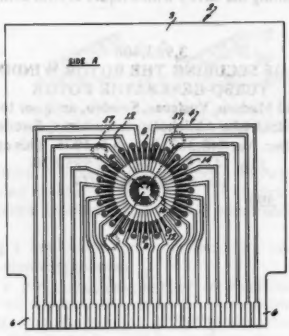
1. The method of forming a support structure for an electric heating element assembly by advancing a piece of sheet metal through a plurality of work stations comprising the steps of:
removing portions of excess material from said piece of sheet metal to provide first strips of sheet metal extending transversely between second and third strips of metal extending in transversely between second and third strips of metal extending in the direction of advance of said piece of sheet metal and lying substantially in a horizontal plane;
bending the transversely extending first strips of metal to form channel-like sections for receiving insulators to support the electric heating elements of the assembly;
loading the insulators onto the channel-like sections; and
bending the second and third strips of metal substantially at right angles to said first strips to provide integral side supports for the support structure of said assembly.

3,952,410

PROBE CARD INCLUDING A MULTIPLICITY OF PROBE CONTACTS AND METHOD OF MAKING

Oliver R. Garretson, and Richard C. Harmon, both of Mountain View, Calif., assignors to Xynetics, Inc., Mountain View, Calif.

Continuation of Ser. No. 455,599, March 28, 1974, Pat. No. 3,905,098, which is a division of Ser. No. 386,999, Aug. 9, 1973, Pat. No. 3,835,381, which is a continuation of Ser. No. 799,472, Feb. 14, 1969, abandoned. This application July 16, 1975, Ser. No. 596,269
The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **6 Claims**

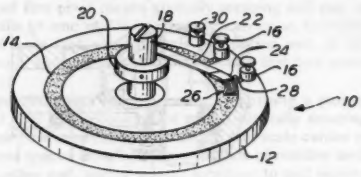


1. A method of producing an electrically conductive probe assembly for testing a substrate having a plurality of terminals,
providing a support member having a support surface with a tapered configuration and having a central aperture,
providing positioning means with a plurality of apertures corresponding to the positions at which the tips of a plurality of electrically conductive probes are to be disposed in the central aperture of the support member,
providing a printed circuit board with an aperture positioned at an intermediate position on the board and with a plurality of printed circuit leads disposed in spaced relationship to one another on the board and with the printed circuit leads extending at one end to a position adjacent to the aperture and at the other end to a position adjacent to at least one edge of the board,
disposing a plurality of electrically conductive probes on the tapered support surface of the support member in spaced relationship to one another and with the tips of the probes extending through the apertures in the positioning means and with the opposite ends of the probes adjacent individual ones of the printed circuit leads,
electrically connecting the probes to the associated ones of the printed circuit leads on the printed circuit board,
providing a base having a support surface with a central aperture,
adhering the support surface on the base to the conductive probes such that the electrically conductive probes are supported on the support surface on the support member, and
removing the support member from the probes after adhering the tapered support surface on the base to the probes.

3,952,411
MULTI-WIRE WIPER CONTACT FOR POTENTIOMETERS AND OTHER ELECTROMECHANICAL DEVICES AND METHOD FOR MAKING SAME

Arnold S. Louis, Hastings-on-Hudson, N.Y., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Sept. 30, 1974, Ser. No. 510,794
Int. Cl.² H01R 9/00
U.S. Cl. 29—630 E 8 Claims



1. A method of forming multi-wire contacts comprising the steps of:

wrapping a plurality of wires including conductive wires and at least one nonconductive wire upon a mandrel to form helical sets of said wires into a single layered coil thereon;

covering longitudinal strips of said coil with circumferentially spaced conductive metal strips which cover said plurality of conductive wires forming said helical sets of wire and do not cover said at least one nonconductive wire;

cutting at least one helical set of said conductive wires including said at least one nonconductive wire;

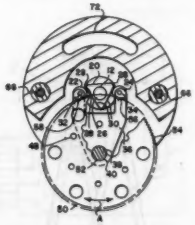
unwrapping said plurality of wires freed by said cutting of at least one helical set of said conductive wires including said at least one nonconductive wire in a continuous flat strand including only said conductive wires covered by said conductive metal strips; and

forming said continuous flat strand into individual multi-wire contacts.

3,952,412
OSCILLATORY SAW

William A. Rhodes, 4421 N. 13th Place, Phoenix, Ariz. 85014

Filed Mar. 28, 1975, Ser. No. 563,146
Int. Cl.² B23D 45/00; B27B 5/29; B26B 19/02; A61B 17/14
U.S. Cl. 30—166 R 14 Claims

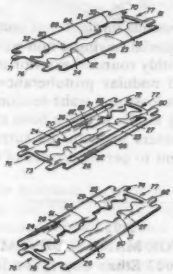


1. In an oscillatory saw; a frame; a motor fixed to said frame; said motor having a rotary output shaft; a multi-lobe cam having an uneven number of lobes in excess of two; said cam fixed on said shaft; a blade pivot bearing fixed on said frame; said blade pivot bearing being generally laterally spaced and axially parallel to said rotary output shaft of said motor; a yoke pivoted on said pivot bearing; a blade carried by said yoke; said blade having an arcuate row of cutting teeth concentric with said pivot bearing; said yoke having a pair of opposed cam follower bearings disposed to straddle said multi-lobe cam such that one of said cam follower bearings may be engaged by one of said lobes while the opposed cam follower bearing is disposed at an area of said cam which is intermediate two of said lobes of said cam; said yoke thus disposed to be oscillated about said pivot bearing; said blade coupled to said yoke for unison oscillatory operation therewith about the axis of said blade pivot bearing.

3,952,413
SHAVING UNIT FOR SAFETY RAZOR

Frank A. Ferraro, Trumbull, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 13, 1974, Ser. No. 532,430
Int. Cl.² B26B 21/54
U.S. Cl. 30—346.58 9 Claims



1. A shaving unit for a double edge safety razor, said shaving unit comprising:

a. a first flexible member including a pair of transversely extending opposite sides, and a pair of spaced end tabs, each one of the first member opposite sides having a cutting edge;

b. a second flexible member including a pair of tansversely extending opposite sides, and a pair of spaced end tabs, each one of the second member opposite sides having a cutting edge, said second member being located above said first member with the cutting edges of said second member being positioned upwardly and inwardly of the cutting edges of said first member, and with the end tabs of said second member being positioned above the end tabs of said first member;

c. flexible means between said first member and said second member for spacing said second member from said first member;

d. a transversely elongated aperture between the tab ends of said shaving unit extending through said first member, said spacing means and said second member between the cutting edges of said first member and said second member for locating said shaving unit in said safety razor;

e. first weld means between said aperture and the cutting edges to each side of said aperture for permanently connecting only one of said first and second members to said spacing means;

f. second weld means between said first weld means and each one of the tab ends of said shaving unit and between said aperture and the cutting edges to each side of said aperture for permanently connecting only the other of said first and second members to said spacing means, said weld means being the only means connecting the blades to the spacing means; and

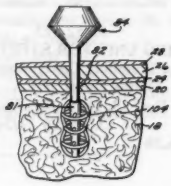
g. a transversely elongated perforation in said spacing means between said first and second weld means and the cutting edges to each side of said aperture.

3,952,414

BONE IMPLANT

Aaron H. Shovers, 2704 Del Amo Blvd., Lakewood, Calif. 90712, and Norman M. Pokras, 4448 Village Road, Long Beach, Calif. 90808

Filed Oct. 29, 1974, Ser. No. 518,476
Int. Cl.² A61C 13/00
U.S. Cl. 32—10 A 20 Claims



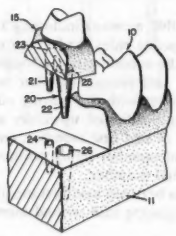
13. A dental endosseous implant that comprises a body of tissue-compatible material having a non-wedge shape with a continuous and smoothly rounded exterior surface characterized by gibbous and nodular protuberances with generally spherical ends and at least one waist section intermediate its length for embedding totally within a bone cavity and at least 2 to about 5 millimeters beneath the surrounding layer of boney tissue, sufficient to permit growth of said boney tissue thereover.

3,952,415

J-SHAPED PIN FOR MAKING DENTAL PROTHESIS

Robert A. Samuel, 3603 Ethan Court, San Jose, Calif. 95123, and Michael W. Layne, 112 Capistrano Drive, Los Gatos, Calif. 95030

Filed Feb. 18, 1975, Ser. No. 550,370
Int. Cl.² A61C 13/00
U.S. Cl. 32—11 23 Claims



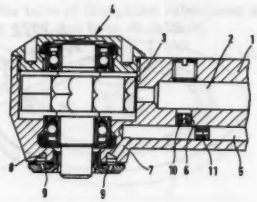
1. An assembly for prothetic dentistry comprising:
a. a base, said base being formed with a plurality of openings;
b. a model secured to said base;
c. a die in said model removably attached to said base; and
d. a pin fixed in said die, said pin comprising:
1. a locating leg projecting from said die and received by one of said openings in said base, said locating leg having a wall with a configuration in which the cross-sectional area of the wall gradually and uniformly decreases;
2. an indexing leg projecting from said die and received by another of said openings in said base, said indexing leg having a wall with a configuration in which the cross-sectional area of indexing leg wall gradually and uniformly decreases; and
3. a retention portion interconnecting said locating leg and said indexing leg and embodied in said die.

3,952,416

DENTAL HANDPIECE

Bernhard Lingenhole, Biberbach, Germany, assignor to Kaltenbach & Voigt, Biberach an der Riss, Germany

Filed Dec. 9, 1974, Ser. No. 531,191
Claims priority, application Germany, Dec. 7, 1973, 7343581[U]
Int. Cl.² A61C 1/10
U.S. Cl. 32—27 5 Claims



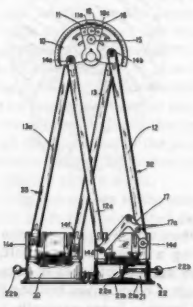
1. A dental handpiece including a head and a holding sleeve associated therewith having at least one coolant line therein, said head having discharge nozzle means for the discharge of a coolant spray, said handpiece having separate gaseous and liquid coolant lines in said holding sleeve in communication with each other, a mixing line positioned downstream of the point of communication between said gaseous and liquid coolant lines adapted to receive gaseous and liquid coolant from said respective lines and to admix same, said discharge nozzle means being in fluid communication with said mixing line and having a smaller effective cross-sectional area than that of said mixing line, and throttle means being positioned in each of said gaseous and liquid coolant lines, the sum of the cross-sectional areas of both of said throttle means being not greater than the effective cross-sectional area of said discharge nozzle means.

3,952,417

ANGLE MEASURING DEVICE

Peter Bestehorn, Jakobneuharting, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Sept. 12, 1974, Ser. No. 505,358
Claims priority, application Germany, Sept. 19, 1973, 2347054
Int. Cl.² G01B 5/24
U.S. Cl. 33—75 R 5 Claims



1. A device for the measurement of angles and angular variations between two surfaces, at least one of which is pivotal relative to the other, comprising:

a disk having vernier indicia means thereon;

a scale carrier having angle indicating indicia means thereon, said angle indicating indicia being positioned adjacent said vernier indicia means, means for rotatably securing said disk and said scale carrier together for rotatable movement with respect to each other and about a common axis of rotation;

first and second foot members each having locking means for separately securing both of said foot members to different ones of two surfaces;

first parallelogram linkage means comprising a pair of first rails and first pivot means pivotally securing said pair of first rails at one end to said scale carrier at locations spaced from said common axis of rotation and, at the other end, and at spaced locations to said first foot member; and

second parallelogram linkage means comprising a pair of second rails and second pivot means pivotally securing said pair of second rails at one end to said scale carrier at locations spaced from said common axis of rotation and, at the other end, and at spaced locations to said second foot member, at least one of said first and said second pivot means being spherical pivot bearings for permitting an angle measurement regardless of translational position changes between said two surfaces in the orthogonally related z and x directions.

3,952,418

MASTER GEAR FOR CHECKING TOOTH CONTACT

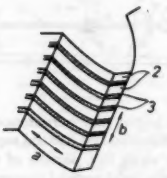
Toshiaki Akamatsu, Okazaki; Masahiko Yasugi, and Mitsuyuki Bito, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

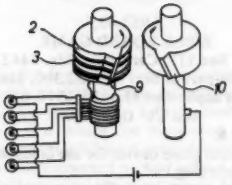
Filed Jan. 30, 1975, Ser. No. 545,632

Claims priority, application Japan, Sept. 21, 1974, 49-114681[U]

Int. Cl.² G01B 7/28; G01M 13/02

U.S. Cl. 33—174 L 5 Claims





1. Master gear for checking tooth contact comprising:

a. at least one terminal tooth,

b. insulating layers provided on the contact surfaces of said terminal tooth, and

c. a plurality of conductive detectors which are embedded at regular intervals in said insulating layers some of which extend in a direction parallel and others of which extend in a direction perpendicular to the flat sides of said tooth.

3,952,419

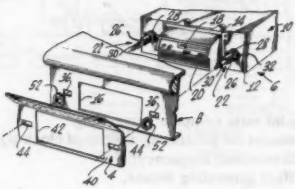
TEMPLATE FOR USE IN INSTALLATION OF AN AUTO RADIO

Fred P. Fohl, Encino, Calif., assignor to Kraco Industries, Compton, Calif.

Filed May 16, 1975, Ser. No. 578,325

Int. Cl.² G01B 3/00

U.S. Cl. 33—174 G 1 Claim



1. A disposable template for determining whether a combined auto radio and tape cartridge unit of predetermined external configuration can be installed in an auto dash, the dash having, a dash opening of predetermined size and two shaft receiving openings spaced on opposite sides of the dash opening; the combined auto radio unit and tape cartridge playing unit having, a main housing, a through-dash housing which extends outwardly from the main housing and is intended to pass through the dash opening, the through-dash housing including a radio tuning panel and a tape cartridge-receiving slot disposed in vertically stacked adjacent relation, two tuning shafts extending outwardly from the main housing parallel to and spaced from the through-dash housing spaced on opposite sides thereof, and adjustment structure permitting limited sideward adjustment of the spacing of each tuning shaft towards and away from the through-dash housing to enable the shafts to be aligned with the shaft receiving openings in the auto dash; the template comprising:

a generally flat sheet of paper; and

a main opening through said sheet of at least adequate size and shape to permit said through-dash housing to pass through said main opening;

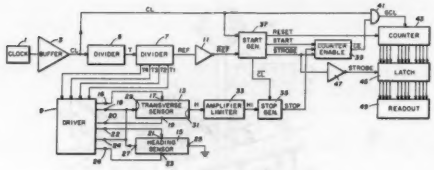
two minor openings through said sheet, each said minor opening being of at least adequate size to permit one of the tuning shafts of the auto radio unit to pass through, the relative locations of said minor openings in said sheet to said main opening therein corresponding to the location in the auto radio unit of the tuning shafts relative to the through-dash housing, each said minor opening in said sheet being elongate in a sideward direction relative to said main opening for a distance corresponding to the range of sideward adjustment of the corresponding one of the tuning shafts relative to the auto radio unit;

whereby when said sheet is placed against the auto dash with said openings in said sheet in alignment with the corresponding openings in the auto dash, it can be determined by visual inspection of the extent to which the openings in the dash overlap said openings in said sheet whether the dash opening and the shaft-receiving openings in the dash are of adequate size and correct placement to permit the through-dash housing and tuning shafts of the auto radio unit to pass through the dash and whether the tuning shafts of the auto radio can be adjusted sufficiently to bring them into alignment with the shaft-receiving openings in the auto dash.

3,952,420
DIGITAL SOLID STATE COMPASS

Robert P. Benjamin, and Harley D. Peter, both of Dallas, Tex., assignors to E-Systems, Inc., Dallas, Tex.

Filed Aug. 5, 1974, Ser. No. 494,620
Int. Cl.² G01C 17/28
U.S. Cl. 33—361 11 Claims



1. A solid state compass comprising:

clock means for generating a series of clock signals at a first predetermined frequency;

Hall effect generating means;

timing signal generating means connected to said clock means, said timing signal generating means being responsive to said clock signals for providing a reference signal and a series of timing signals;

driving means connecting said timing signal generating means, said driving means being responsive to said timing signals for providing driving signals for driving said Hall effect generating means, said Hall effect generating means being operative for providing a heading signal representative of an orientation angle between a direction of orientation of said Hall effect generating means and magnetic north;

start signal generating means connected to said clock means, and said timing signal generating means, said start signal generating means being responsive to said clock signals and said reference signals for providing a series of start signals at a second predetermined frequency;

counter means; and

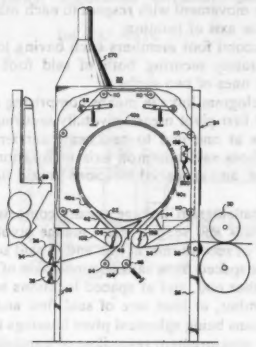
control means connecting said Hall effect generating means and said clock means with said counter means, said control means being responsive to said start signal for enabling said counter means to begin counting said clock signals, said counter means being operable to provide a count signal representative of the number of clock signals counted, said control means being further responsive to said heading signal to disable said counter means when said count signal is representative of said orientation angle.

3,952,421
DIELECTRIC HEATING ARRANGEMENT FOR DRYING A CONTINUOUSLY MOVING WEB OF MATERIAL

Thomas L. Wilson, Louisville; Charles M. Loring, Jr., and Peter H. Smith, both of Anchorage, all of Ky., assignors to Chemetron Corporation, Chicago, Ill.

Filed Oct. 18, 1974, Ser. No. 515,923
Int. Cl.² F26B 3/34
U.S. Cl. 34—1 28 Claims

1. In a system for drying a web of flexible material, the combination of, means defining a cylinder whose axis is perpendicular to the length of the web, means for moving the web to be dried in an arcuate path conforming to the periphery of said cylinder over a substantial portion of the circumference thereof, a first series of electrodes positioned close to but out of contact with said web around said substantial portion of the circumference of said cylinder, a second series of electrodes interspersed with said first series of electrodes, said first and second series of electrodes collectively forming a surface which is concentric with said cylinder and outside the periphery thereof, and means for applying and R.F. voltage between said first and second series of electrodes, whereby said web is dried by dielectric heating due to the R.F. field developed

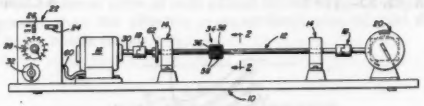


between said first and second series of electrodes as said web is moved in said arcuate path.

3,952,422
PERSISTENCE TEST APPARATUS

David B. Roberts, Jr., 211 4th Place, SW., Largo, Fla. 33540

Filed Nov. 15, 1974, Ser. No. 524,344
Int. Cl.² G09B 19/00
U.S. Cl. 35—22 R 10 Claims



1. Apparatus for testing the persistence of an individual subject including a threaded rod, spaced supports for said rod, nut means movable along the portion of the length of said threaded rod between said spaced supports, power means connected to one end of said threaded rod, means for controlling the speed and direction of rotation of said threaded rod, and a tachometer connected to the end of said threaded rod opposite to said power means.

3,952,423
BIBLE BOARD GAME

Dale R. Gentry, Box 117, Carrollton, Mo. 64633

Continuation-in-part of Ser. No. 432,300, Jan. 10, 1974, abandoned. This application Mar. 14, 1975, Ser. No. 558,228
Int. Cl.² G09B 1/14
U.S. Cl. 35—23 R 8 Claims

1. An educational game device for use in teaching the books of the Bible comprising:

a board having a plurality of spaced, three-sided uniform slots formed therein, said board defining slot edges extending the entire thickness of said board along the opposite sides of each slot; and

a plurality of blocks representing the books of the Bible, each of said blocks being of considerably greater thickness than said board and each of said blocks including opposite sides having elongate grooves therein sized to mate with said slot edges, each groove having a width substantially equal to the thickness of said board and slot edges, whereby said blocks are slidably insertable into

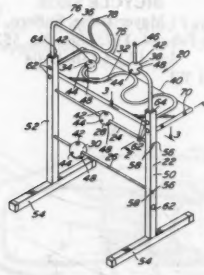
said slots with said grooves receiving said slot edges to interlockingly retain said blocks in place on said board

with each block projecting a substantial distance from the board in opposite directions.

3,952,424
METHOD AND APPARATUS FOR IMPROVING MUSCULAR COORDINATION

Paul Herr, Huntingdon Valley, and Dubi Leumi, Philadelphia, both of Pa., assignors to Motor Skills Research, Inc., Horsham, Pa.

Filed Dec. 19, 1974, Ser. No. 534,499
Int. Cl.² G09B 11/00
U.S. Cl. 35—29 R **8 Claims**

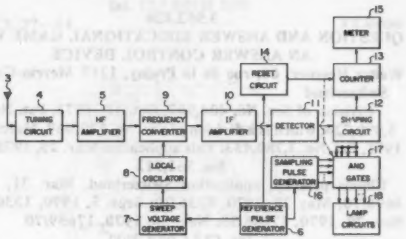


1. Apparatus for developing muscular coordination to facilitate the learning of writing skills comprising first means for establishing a first linear path, a first movable member supported by said first means for movement along said path, second means for establishing a second linear path, a second movable member, supported by said second means for movement along said second path, third means for establishing an undulating path, a third member supported by the third means for movement along said undulating path, fourth means for establishing a looped path, a fourth member supported by said fourth means for movement along said looped path and a frame including support means for supporting said first and second means, with the linear paths established thereby, horizontally and including additional support means for supporting either said third means or said fourth means so that the path established thereby is either oriented horizontally or vertically.

3,952,425
RESPONSE ANALYZER

Koich Tanaka, Soka; Genichi Tagata, Koshigaya, and Kiyomi Abe, Noda, all of Japan, assignors to Pentel Kabushiki Kaisha, Japan

Filed Oct. 8, 1974, Ser. No. 513,052
Int. Cl.² G09B 5/00; G07C 13/00
U.S. Cl. 35—48 R **2 Claims**



1. A response analyzing system comprising, in combination:

a plurality of answering devices each comprising, a transmitter operable for transmitting a continuous wave response signal, and means for operating said transmitter to transmit or not transmit the response signal in response to a question asked, wherein the transmitters all develop response signals having mutually different frequencies; and

a determination unit comprising, a tuned circuit for receiving the response signals developed by said plurality of answering devices and having a bandwidth sufficient to pass all the received response signals, a reference pulse generator for developing a train of periodic reference pulses, a sweep voltage generator responsive to the periodic reference pulses for developing a periodic time-varying sweep voltage having a period synchronized with the period of the reference pulses, a voltage-controlled local oscillator receptive of and controlled by the time-varying sweep voltage for developing a local oscillator signal having a continuously and periodically varying frequency which varies with a period synchronized with the period of the reference pulses, a frequency converter receptive of the response signals and the local oscillator signal for developing a plurality of intermediate frequency signals each having a periodically time-varying frequency and each corresponding to a respective one of the received continuous wave response signals passed by said tuned circuit, a narrow band frequency-selective circuit receptive of the plurality of intermediate frequency signals for passing segments of respective ones of the intermediate frequency signals for periods of time in which the respective ones of the intermediate frequency signals are within the passband of said frequency selective circuit, pulse generating means responsive to the segments of the respective ones of the intermediate frequency signals passed through said frequency-selective circuit for developing a pulse during each occurrence of each respective segment of the intermediate frequency signals passed through said frequency selective circuit, a sampling pulse generator responsive to the periodic pulses for developing a sequence of sampling pulses each corresponding to a different one of the response signals and each occurring when the intermediate frequency signal which corresponds to the corresponding response signal is within the passband of said frequency-selective circuit, a plurality of AND gates each recepetive of a respective pulse of the sequence of sampling pulses and all receptive of the pulses developed by said pulse generating means whereby one of said AND gates develops an output signal upon the simultaneous occurrence of a pulse developed by said

pulse generating means and a pulse developed by said sampling pulse generator, and a plurality of indicators each responsive to the output of a respective one of said AND gates for indicating when the respective one of said AND gates develops an output, whereby each of said indicators corresponds to a different one of the response signals and is effective to indicate when the corresponding response signal has been received.

3,952,426

QUESTION AND ANSWER EDUCATIONAL GAME WITH AN ANSWER CONTROL DEVICE

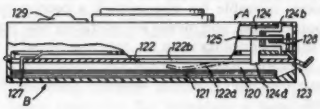
Walter Hesener, 66, rue de la Prulay, 1217 Meyrin-Geneva, Switzerland

Division of Ser. No. 404,907, Oct. 10, 1973, Pat. No. 3,890,724, which is a division of Ser. No. 129,469, March 30, 1971, Pat. No. 3,780,453. This application Mar. 25, 1975, Ser. No. 561,912

Claims priority, application Switzerland, Mar. 31, 1970, 4696/70; May 29, 1970, 8136/70; Sept. 5, 1970, 13300/70; Nov. 20, 1970, 17285/70; Nov. 30, 1970, 17659/70

Int. Cl.² G09B 3/00

U.S. Cl. 35—48 A 3 Claims



1. In a educational game, which game comprises the combination of a set of question carrying elements, a code bearing means carrying a plurality of code means, a predetermined number of separate setting means each being movable in a first direction relative to the code means into one of several possible positions corresponding to answers to a given question, one such answer being the correct answer, means for permitting relative movement in a second direction transverse to the first direction between the code bearing means and the plurality of setting means, engagement means on a predetermined number of the setting means which selectively engage cooperating portions of the code means to prevent relative movement in the second direction between the code bearing means and the setting means when any one of the setting means is in a position corresponding to an incorrect answer, and to permit relative movement in the second direction between the code bearing means and the setting means only when a predetermined number of the setting means are in positions corresponding to respective correct answers, first indicating means for indicating the relative position between the setting means and the code bearing means, code orienting means adapted to move relative to the code bearing means when preparing the game for use and adapted to be fixed relative to the code bearing means when the game is in use, and second indicating means for indicating the relative position between the code orienting means and the code bearing means: a set of question-carrying elements, each element containing a first correlating means for displaying the requisite setting of said first indicating means for effective use of said selected question-carrying element, a second correlating means for displaying the requisite setting of said second indicating means for effective use of said selected question-carrying element, and a plurality of questions, the respective answers to which are designed to be entered on said game by moving corresponding ones of said setting means, whereby when said predetermined number of said setting means are in positions corresponding to correct answers to the plurality of questions on the question-carrying element, relative movement in said second direction is permitted between said code bearing means and said setting means, and when any one of said setting means is in a position corresponding to an incorrect answer, such relative movement is prevented.

3,952,427

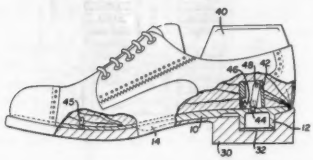
INSOLE FOR FOOTWEAR

Elisabeth von den Benken, and Henry von den Benken, both of 2212 Centre St., West Roxbury, Mass. 02132

Filed May 9, 1974, Ser. No. 468,223

Int. Cl.² A43B 00/00

U.S. Cl. 36—103 WI 2 Claims



1. An insole for footwear having a molded shank reinforcement rib for which a clearance cavity is provided in a corresponding outer sole and a molded aligning protrusion located in its heel area pointing toward the outer sole of a shoe and being shaped so as to fit a cavity in a corresponding outer sole thereby assuring correct alignment of outer sole and insole, and a plurality of molded lasting hooks located along its edge pointing toward the outer sole and being so shaped that an upper will not slip off when it is tied to said lasting hooks.

3,952,428

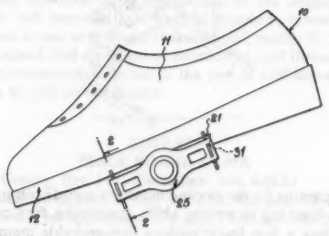
BICYCLE SHOE

Robert A. Polsky, 31 Mayer Drive, Suffern, N.Y. 10901

Filed Feb. 24, 1975, Ser. No. 552,838

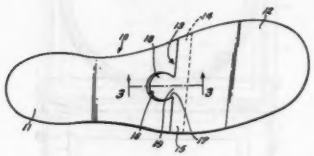
Int. Cl.² A43B 13/04

U.S. Cl. 36—131 WI 8 Claims



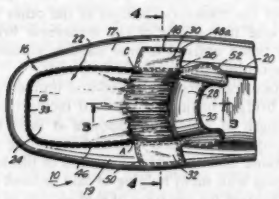
1. A shoe for use in propelling bicycles equipped with pedals, said shoe comprising, in combination, an upper and an outsole, said outsole consisting of heel, instep and toe portions, said instep portion being substantially recessed with respect to said heel and toe portions, said heel portion including a sloping face having a forward point adapted to engage said bicycle pedal, and a plurality of spaced protuberances and cavities in said instep portion adapted for respective engagement with similarly spaced cavities and protuberances on said bicycle pedals, whereby said bicycle pedals are gripped by said shoes.

3,952,429
SECTIONAL SHOE MID-SOLE
Dwight L. Thomas, Blanchester, Ohio, assignor to Vulcan Corporation, Cincinnati, Ohio
Filed Jan. 13, 1975, Ser. No. 540,720
Int. Cl.² A43B 13/14
U.S. Cl. 36—31 2 Claims



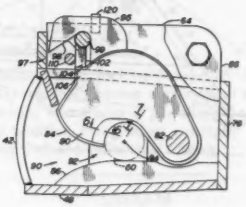
1. A mid-sole for use in the construction of footwear comprising a one-piece heel and shank part composed of a rigid, moldable material, a lateral shelf formed on the forward edge portion of the heel and shank part, a socket molded into the upper surface of the heel and shank part and having a restricted mouth opening onto the shelf, a forepart composed of a flexible, moldable material, a lateral, downwardly facing lip formed on the rear edge portion of the forepart interfitted with the shelf on the heel and shank part, a tongue connected to the rear edge of the forepart by a restricted neck, said tongue and neck on the forepart respectively interfitting with the socket and mouth on the heel and shank part to form a connection between the mid-sole parts.

3,952,430
SHOE CONSTRUCTION
Jerome Pankin, New York, N.Y., and Beverly Ann Feldman, Albufera, Spain, assignors to Pankin International, Ltd., New York, N.Y.
Continuation of Ser. No. 569,284, April 18, 1974, Pat. No. 3,916,539. This application Oct. 29, 1975, Ser. No. 626,751
Int. Cl.² A43B 11/00
U.S. Cl. 36—51 9 Claims



1. A construction for a shoe including a vamp, a sole, and a heel, the construction comprising:
a. a tongue member,
b. a lining member, the tongue member and the lining member being joined to one another and to the vamp, and forming a continuous tunnel across the throat of the shoe, and
c. an elastic gore running from one side of the vamp across the throat of the shoe to the other side of the vamp and fixed within the tunnel,
d. the gore having one face secured to the tongue member along the length of the gore within the tunnel and having its other face secured to the liner member along the length of the gore within the tunnel,
e. the gore, when relaxed, shirring the tongue member at its mid-section and the lining member.

3,952,431
VEHICULAR CARRIED PLOW COUPLING
William Gledhill, and Philip Leland Sherman, both of Galion, Ohio, assignors to Gledhill Road Machinery Company, Galion, Ohio
Continuation of Ser. No. 516,563, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 379,966, July 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 211,076, Dec. 22, 1971, Pat. No. 3,746,368. This application May 29, 1975, Ser. No. 581,853
Int. Cl.² E01H 5/00
U.S. Cl. 37—41 3 Claims

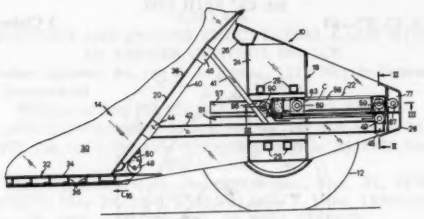


1. The combination of a snow plow and a truck,
the truck including a female coupling member attached to its front,
the snow plow including a male coupling member carried on its rear,
means on said truck for raising and lowering the blade of the snow plow,
means on the plow to facilitate limited universal angular movement thereof, the improvement comprising:
said female coupling member comprising a housing having a convex, forward force receiving surface having a substantially horizontal axis, said surface including a recess area therein;
latching hook means mounted within said recess area for pivotal movement about a substantially horizontal axis between opened and closed positions, said latching hook means including a latching surface;
said male coupling member comprising a rigid, generally planar frame having a loop protruding outwardly thereof extending into and retained in said recess area by latching engagement with said latching surface of said latching hook means, said force receiving surface of said female coupling member and said frame of said male coupling member being juxtaposed for transmitting force from one to the other, said latching surface and the cooperating engaging surface of said loop each being such to facilitate relative movement therebetween for permitting, raising, lowering, and tilting of said snow plow between different desired positions while said male coupling member is engaged with said female coupling member.

3,952,432
MECHANISM FOR MOVING SCRAPER BOWL EJECTOR BLADE
Richard F. Boersma, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.
Filed Aug. 5, 1974, Ser. No. 494,812
Int. Cl.² E02F 5/00
U.S. Cl. 37—126 AE 7 Claims

1. In a machine including a supporting frame and a component movable with respect to said frame to perform a function, said component being movable from a retracted position to a fully extended position, a carriage mounted on said frame for movement with respect to said frame between a retracted position and an extended position, a plurality of extendable and retractable hydraulic rams mounted on and movable with said carriage, at least two of said rams being connected to said

component, and at least another of said rams being connected to said frame, said two rams embodying a total effective piston area greater than that of said other ram, and means including a plurality of fluid lines interconnecting said rams and movable with said carriage to supply pressurized fluid simultaneously to all of said rams while said rams are retracted and said carriage is in retracted position to initially cause said two



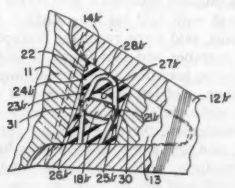
rams to exert more force than said other ram and to extend fully and move said component from retracted position part way toward fully extended position while said carriage remains in retracted position and to subsequently cause said other ram to extend fully and move said carriage from retracted position to extended position and thereby cause said component to move further to fully extended position.

3,952,433

SPRING CLIP RETAINING MEANS FOR EARTHWORKING TIPS

Lloyd K. Heinold; Eugene L. Helton, both of Peoria, and Donald J. Larson, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 3, 1974, Ser. No. 502,827
Int. Cl.² E02F 9/28; F16B 21/07, 21/18
U.S. Cl. 37—142 A **15 Claims**



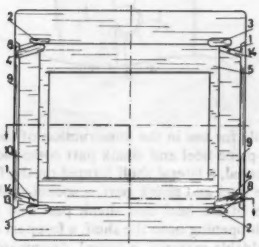
1. In an earthworking device comprising a support member, a work tool mounted on a forward end of said support member, a pin disposed in aligned bores formed through said support member and said work tool and retaining means releasably holding said pin in said bore, the improvement wherein said retaining means comprises an at least generally U-shaped spring clip straddling diametrically opposite sides of said pin in locked, frictional engagement therewith and an elastomeric member at least substantially encapsulating said spring clip, said elastomeric member at least substantially filling a complementary recess formed in one of said support member and said work tool and further comprising concavities formed on opposite sides of said elastomeric member and located in that portion of the side of the member which is closest to the point of contact between said pin and said spring clip for creating space to permit expansion of said spring clip in said recess.

3,952,434

SLIDE-FRAME

Peter Florjancic, St.-Martin-Strasse 12, D-81 Garmisch-Partenkirchen, Germany

Continuation of Ser. No. 206,687, Dec. 10, 1971, abandoned.
This application Oct. 15, 1973, Ser. No. 406,384
Claims priority, application Austria, Dec. 16, 1970, 11328/70
Int. Cl.² G09F 1/12
U.S. Cl. 40—152 **5 Claims**



1. A unitary frame for a section of photographic film consisting of a pair of masks made of plastic material, each mask comprising

a central view opening therein, said opening having relieved inner edges thereon

a recess in the inner face which surrounds said central view opening, said recess being defined by

a pair of parallel longitudinal bridges and

a pair of parallel transverse bridges,

said masks being fixed together along said longitudinal bridges with the inner faces of the masks facing one another,

said recess forming an enclosed film bed,

the inner faces of the transverse bridges of one mask being substantially in contact with the corresponding inner faces of the transverse bridges of the other mask,

at least one facing pair of the transverse bridges of said masks being unfixed to one another across at least the corresponding width of said film bed,

at least one transverse bridge of said unfixed pair of transverse bridges having an outward facing chamfered face the length of which corresponds at least to the corresponding width of said film bed providing a funnel into said frame through which a section of photographic film may pass with slight bulging of said unfixed pair of transverse bridges for insertion of said section of film into said film bed and said unfixed pair of transverse bridges return to being substantially in contact upon completion of the insertion of said section of film into said film bed.

3,952,435

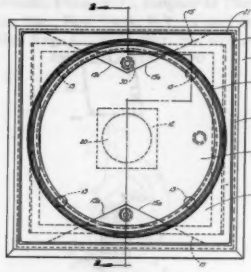
PHOTO FRAME AND THE LIKE

Daniel H. Olsen, Toledo, Ohio, assignor to Midland Insta-Change Company, Cincinnati, Ohio

Filed July 17, 1974, Ser. No. 489,232
Int. Cl.² G09F 1/12
U.S. Cl. 40—152.1 **4 Claims**

1. In combination with a photo frame and the like, a back pan having a back surface, and side walls extending between said back surface and said frame, and removably secured to the rear of said frame, said back pan having a recess in each

side wall, each said recess providing a slot between said back pan and the rear of said frame, said back pan having a hole



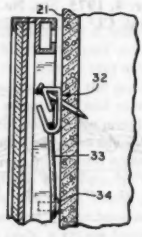
centrally disposed on at least two adjacent sides near said recesses.

3,952,436

DEVICE FOR LOCKING A FRAMED PICTURE TO A WALL

Horst Kuhnke, 9 Echo Court, Hawthorn Woods, Ill. 60047

Filed July 7, 1975, Ser. No. 593,758
Int. Cl.² G09F 1/12
U.S. Cl. 40—152.1 7 Claims



1. A device for locking a picture or the like in a frame to a wall, wherein the framed picture is hung at its upper end by conventional means, said device comprising a body, an arm connected to and extending from the body along one side thereof, a fastener for mounting the body and arm to the wall, hole means through the arm and body for receiving said fastener so as to secure the device to the wall and allow the device to rotate on the fastener, said body and arm coacting with the frame to selectively lock the framed picture substantially flush to the wall when rotated to lock position or permit the same to be removed therefrom when rotated to unlock position, and a wrench-engaging portion on said body adapted to be engaged by a wrench and rotated between lock and unlock positions when the frame is substantially flush with the wall said wrench-engaging portion being on the side of the body adjacent the wall.

3,952,437

PICTURE FRAME CONSTRUCTION

Robert W. Mitchell, Saint Joseph, Mich., assignor to Photo Systems, Inc., Ann Arbor, Mich.

Filed Apr. 5, 1974, Ser. No. 458,087
Int. Cl.² G09F 1/12
U.S. Cl. 40—152.1 14 Claims

1. A display frame construction for supporting a plurality of display sheet means, each sheet having opposed, generally parallel edges, said frame comprising opposed plates having respective slot-defining portions which follow the contour of the plate edges and define closed congruent slot patterns, each of said slot patterns having arcuate portions receiving one of said opposed edges, and retractable means urging said plates toward one another and against said edges to entrap the display sheet means therebetween whereby said retractable means is operatively connected to each of said plates and maintains said plates in spaced, generally parallel relationship

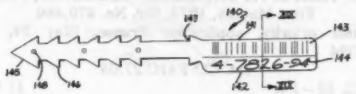
with said display means lockingly disposed therebetween to form a display assembly having a cylindrical surface portion; said sheet means comprising a plurality of adjacent display sheet means abutting along edges generally normal to said plates to form a closed cylindrical display.

3,952,438

ANIMAL MARKING APPARATUS

Robert L. Propst, and Howard B. Propst, both of Ann Arbor, Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Continuation of Ser. No. 159,784, July 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 12,056, Feb. 17, 1970, abandoned. This application Dec. 26, 1973, Ser. No. 427,831
Int. Cl.² G09F 3/00
U.S. Cl. 40—300 18 Claims



1. A tag particularly adapted to be affixed to an animal to identify the same with certain information comprising at least one information bearing portion and an animal attaching portion, said portions being formed out of a single integral piece of flexible material, and said information bearing portion having said information coded thereon in machine readable form; said attaching portion including means for holding said tag in a predetermined, standardized position on an animal whereby said machine readable, coded information can be read by a suitable machine; said tag being sickle shaped, said information bearing portion extending in a generally straight direction and said attaching portion curving out of said direction.

3,952,439

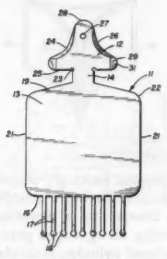
ANIMAL TAG

Walter R. Armand, 1918 Newton St., Denver, Colo. 80204

Filed June 17, 1974, Ser. No. 479,915
Int. Cl.² G09F 3/04
U.S. Cl. 40—301 6 Claims

1. An animal identification tag for attachment in a cut slit passing through an ear or other skin area of an animal comprising insert and body sections for forward and rearward disposition, respectively, and an interconnecting neck portion therebetween, said identification tag being formed unitarily of resilient sheet material having generally planar top and bottom faces, said body section being of larger size than said insert section and adapted to receive identification markings on the opposed top and bottom faces thereof, said neck portion extending forwardly from said body section and being of width corresponding to the width of the cut slit through which it will extend and of substantially reduced width with respect

to said body section, angularly disposed introductory side edges for said insert section diverging outwardly from a forward entrance end, a terminal or base edge for said insert section connected to said narrower neck portion and extending outwardly therefrom to intersect said introductory side edges, and an angled surface intersecting a planar face of said



insert section at said introductory side edges to provide a tapered section that reduces the thickness of said sheet material at positions disposed apart a distance greater than the width of said neck portion whereby the insert section of said tag interacts with a tag receiving slit cut in an animal's skin to cooperatively enfold said insert section as it is moved in a forward direction through said cut slit.

3,952,440

FIREARMS HAVING TWO ORIFICES FOR EJECTION OF THE EMPTY SHELLS

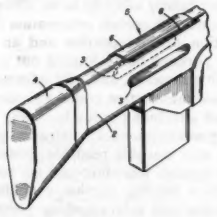
Paul E. Tellié, 20 rue Bergson, 42000 St. Etienne, France

Filed May 16, 1974, Ser. No. 470,460

Claims priority, application France, May 29, 1973, 73.19394

Int. Cl.² F41C 27/08

U.S. Cl. 42—1 R 11 Claims



1. A firearm having two separate orifices for the ejection of empty shells so that a marksman can use as desired a selected one of either of the two ejection orifices, said firearm being provided with closure means, adapted to be actuated by the marksman, for closing that one of the two ejection orifices which is not in use.

3,952,441

CLIP FOR SEMI-AUTOMATIC FIREARM

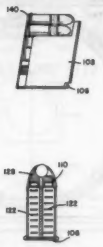
William A. Tant, 1220 Daladams St., Raleigh, N.C. 27603

Continuation-in-part of Ser. No. 350,747, April 13, 1973, Pat. No. 3,857,324. This application Oct. 18, 1974, Ser. No. 515,882

Int. Cl.² F41C 25/02

U.S. Cl. 42—50 4 Claims

1. In a firearm having means for inserting one cartridge at a time into a chamber, the improvement comprising: a magazine adapted to hold a plurality of cartridges, said magazine including a pair of side-by-side cartridge chambers separated by a partition extending longitudinally through said magazine and laterally in spaced relationship to the rear wall thereof, the upper outer side of each cartridge chamber being tapered



inwardly toward each other so as to converge the upwardly moving cartridges of each chamber into single file for feeding to the firearm chamber.

3,952,442

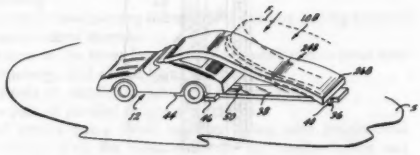
LAUNCHER FOR A TOY VEHICLE, INCLUDING A SHIM FOR SUPPORTING THE VEHICLE REAR END

James Robert Livesey, Hawthorne, and Felix Griauzde, Pleasonton, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 4, 1975, Ser. No. 565,186

Int. Cl.² A63H 17/26

U.S. Cl. 46—206 1 Claim



1. A launcher for launching a toy wheeled vehicle adapted to travel on a supporting surface, said vehicle having a body with a sloping roof portion and a bottom portion normally spaced from said surface, said launcher comprising:

a first elongated member having first and second ends;

means provided at said first end of said first elongated member for guiding said vehicle during launching;

means provided intermediate said first and second ends of said first elongated member for positioning said vehicle preparatory to launching;

a second elongated member having first and second ends;

means pivotally connecting said second end of said first elongated member to said first end of said second elongated member with said second elongated member overlying said first elongated member, said second end of said second elongated member imparting a forward thrust to said vehicle when it is in position on said vehicle guide means with said second end of said second elongated member contacting said sloping roof portion of said body and with a downward force being exerted on said second elongated member between the first and second ends thereof; and

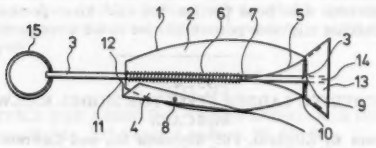
control means comprising a shim provided on said vehicle guide means beneath said vehicle bottom portion when said vehicle is in position on said guiding means for engagement by the rear end of said vehicle bottom portion to limit the amount the front end of said vehicle will become elevated while said second end of said second member is transmitting said downward force during launching of said vehicle.

3,952,443
FISHING REEL ACCESSORY
Joseph F. Kaminski, Utica, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Aug. 12, 1974, Ser. No. 496,350
Int. Cl.² A01K 89/00
U.S. Cl. 43—25 2 Claims

1. A fishing reel accessory for a fishing reel mounted on a fishing pole at the handle thereof and having fishing line wound therearound, said fishing reel accessory comprising

a brake member mounted on the pole adjacent the handle and the reel for selectively and manually preventing unwinding of the reel, said brake member comprising a bore formed through the pole between the handle and the reel, an arm having first and second spaced opposite ends and a center substantially equidistantly spaced from the first and second ends, said arm being pivotally mounted at substantially its center in the bore and extending beyond the pole at both ends, a recess formed in the arm at the first end to accommodate a finger of a user and braking material affixed to the arm at the second end in a manner whereby the second end of the arm is normally spaced from the line on the reel and when the first end of the arm is gripped and pulled by a finger of the user, the braking material at the second end of the arm abuts the line on the reel and prevents the unwinding of the reel.

3,952,444
SPOON LURE
Yrjö Sakari Hämeen-Anttila, Alakiventie 1 C 35, Helsinki, Finland (00920)
Filed July 22, 1974, Ser. No. 490,671
Claims priority, application Finland, Oct. 31, 1973, 3372/73
Int. Cl.² A01K 83/02
U.S. Cl. 43—34 4 Claims



1. A spoon lure comprising a lure body;

a plunger extending axially through the length of the lure body and extending beyond one end thereof;

at least one hook located within the lure body and connected to the plunger, the hook having a slightly arcuate curvature without a reversal of curvature;

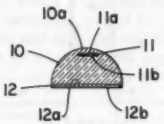
a spring located entirely within the lure body and helically surrounding the plunger for substantially its entire length when the spring is in its released state, the spring urging the vigourous projection of the hook externally of the lure body;

trigger means for maintaining the spring in compression and to release the spring, the trigger means comprising a trigger located externally of and pivotably connected to the lure body and extending substantially for the entire length of the lure body, the trigger having a latch for engagement with a notch in a portion of the plunger adjacent to but extending beyond said one end of the lure body;

means in the other end of said lure body for guiding the hook or hooks during projection externally of the lure body;

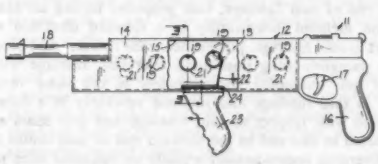
the hook or hooks being loaded by being drawn into the lure body by moving said plunger against the force of the spring away from the hook or hooks and engaging said latch with said notch.

3,952,445
SIMULATED EYE CONSTRUCTION
Ronald K. Liebert, 7514 W. 93rd St., Zionsville, Ind. 46077
Filed Aug. 25, 1975, Ser. No. 607,140
Int. Cl.² A01K 85/00
U.S. Cl. 43—42.34 8 Claims



1. A simulated eye construction comprising a generally cup-shaped substantially transparent body presenting a curved outer front surface and a generally flat planar rear surface, a thin wafer having its opposite faces of contrasting colors imbedded in said body at the apex area of the body and oriented so that one of its colored faces is spaced from and faces said rear surface of the body and its other colored face is directly visible through the apex area of the body, and means overlying said rear surface of the body providing a reflecting mirror-like surface adjacent thereto whereby said one colored face of the wafer is reflected through said body to provide a contrastingly colored penumbra for the face of said wafer visible through the body.

3,952,446
TOY HAVING LOOSELY MOUNTED CYLINDERS AND SLIDABLE STRIKER
Frank Gybowski, 34 Edgewood Way, New Haven, Conn. 06515
Filed Aug. 8, 1974, Ser. No. 495,864
Int. Cl.² A63H 5/00
U.S. Cl. 46—1 R 5 Claims



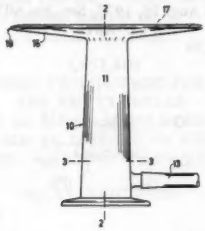
1. A toy comprising the combination of:

a housing having two opposing, generally parallel walls;
a plurality of rods mounted between said walls in parallel, spaced apart rectilinear relationship;
each said rod loosely carrying a hollow cylinder adapted to swing eccentrically on and around said rod; and
a hand operable member slidably mounted in said housing; guide means in said housing defining a generally longitudinal path of travel for said member transverse to the axes of said rods, said member having a generally upright tongue-like portion extending upwardly to a height sufficient for tangentially striking said cylinders during said travel of said member, whereby said cylinders are sequentially activated on said rods when said member is moved along said path.

3,952,447
BUBBLE FORMING DEVICE

Walter Edward Hackell, 73 Alexander Ave., Napier, New Zealand

Filed Aug. 13, 1974, Ser. No. 497,054
Claims priority, application New Zealand, Aug. 16, 1973, 171710
Int. Cl.² A63H *33/28*
U.S. Cl. 46—6 **20 Claims**



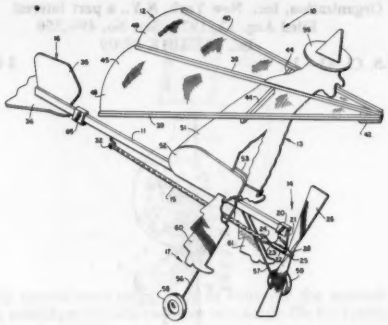
1. A bubble forming device comprising a body having an annular open topped chamber, an air supply tube or pipe the bore of which is in communication with the said chamber and is so positioned that air passing therethrough enters the annular chamber tangentially to the axis thereof, a disc mounted on said body covering the open top of the chamber and having a central opening in communication with said chamber, the disc and opening being concentric with said chamber and the outer face of the disc is provided with a series of slots extending radially from the central opening.

3,952,448
TOY AIRPLANE

Robert G. Kabchef, 217 Donna Lyn Drive, Smyrna, Ga. 30080

Filed Sept. 26, 1974, Ser. No. 509,436
Int. Cl.² A63H *27/00*
U.S. Cl. 46—78 **6 Claims**

1. A toy airplane comprising an elongated fuselage, a tail assembly at one end of said fuselage and a propeller at the other end of said fuselage, said propeller having an axis of rotation inclined downwardly in a forward direction with respect to said fuselage, power means for rotating said propeller, a paraglide wing positioned over said fuselage with a center spar extending approximately in the same vertical plane as said fuselage and inclined upwardly in a forward direction with respect to said fuselage and side spars each connected at one end to the forward end of said center spar and diverging approximately equally on opposite sides rearwardly from said center spar, flexible sheet material connected to each of said center and side spars, an approximately flat connecting structure connected between said fuselage and the center spar of said paraglide wing with the plane of said

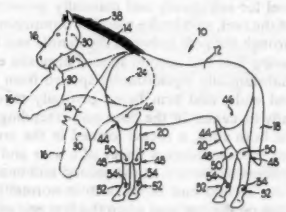


approximately flat connecting structure extending parallel to said fuselage and said center spar.

3,952,449
ARTICULATED FIGURE TOY

Rouben T. Terzian, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Apr. 18, 1975, Ser. No. 569,167
Int. Cl.² A63H *3/46*
U.S. Cl. 46—161 **22 Claims**



21. An articulated figure toy in the form of a four legged animal, comprising:
a torso portion having four legs depending therefrom;
an elongated neck portion having a head portion on one end thereof;
means defining a position retaining frictional rotary joint between the other end of said neck portion and the front of said torso portion to provide for relative articulated movement therebetween, including means for limiting said relative movement to a vertical direction when the figure toy is in an erect position; and
said neck portion being fabricated of resiliently flexible material for increased relative articulated movement between said head portion and said torso portion by bending said neck portion relative to the torso portion.

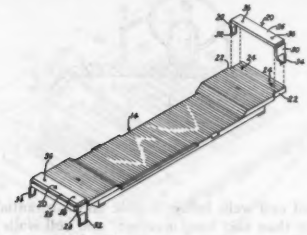
3,952,450
PROTRUDING LADDER STEPS FOR MODEL RAILWAY BOXCARS

Clarence K. Edwards, 865 Morrison St., and Lawrence D. Edwards, 2816 Rosemont Ave., both of Medford, Oreg.

Filed Feb. 16, 1972, Ser. No. 226,701
Int. Cl.² A63H *19/16*
U.S. Cl. 46—218 **4 Claims**

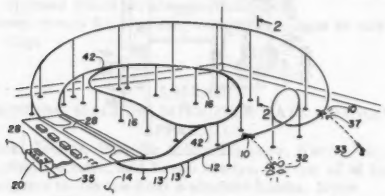
1. A model railway boxcar comprising, in combination,

a. a rigid car floor unit
b. a substantially rigid, unitary car body unit, and
c. a protruding-step-simulating unit distinct from the floor and body units, composed of more highly flexible and resilient, moldable material than the floor and body units, said protruding-step-simulating unit constructed and arranged to have fixed interfitting relation with at least



one of said other units and to be retained in place by them, said protruding-step-simulating unit comprising a cross-member engageable with the upper surface of a floor end, at least one downwardly extending side member, and at least one terminal step member integral with such side member, and constructed and arranged to extend below and beyond the lower boundary of the car body.

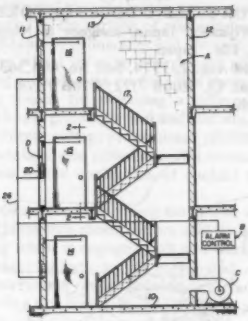
3,952,451
MODEL AIRPLANE TRACK
Emil G. Innocenti, Hawthorne, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Nov. 4, 1974, Ser. No. 520,300
Int. Cl.² A63H 27/04
U.S. Cl. 46—249 **1 Claim**



1. A toy airplane and track assembly comprising a track which may be mounted on vertical support members and an airplane-shaped vehicle fitted with wheels which ride on said track, said vehicle wheels being driven by an electrical motor in the vehicle, together with means to conduct electricity from an external control panel and power supply mounted on the track and means to conduct electricity from the track to the airplane motor mounted on the airplane vehicle, in which the airplane-shaped vehicle is fitted with detachable wing sections which separate from the vehicle when hit by a pellet from a toy gun.

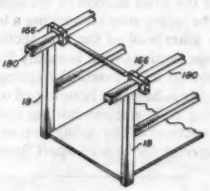
3,952,452
DEVICE FOR ASSISTING THE OPENING OF A DOOR
Thomas Hebda, 235 Vance, Lombard, Ill. 60148
Filed Mar. 14, 1974, Ser. No. 451,042
Int. Cl.² E05F 15/20
U.S. Cl. 49—3 **4 Claims**

1. A device for assisting the opening of a door comprising a chamber having a door which opens into said chamber, means for providing a signal, means responsive to said signal for generating a pressure within said chamber and against said door to thereby produce a draft from the interior of said chamber to the exterior thereof when said door is opened, and means responsive to said signal for urging said door toward open position to compensate at least in part for said pressure which is applicable against said door, said means for urging said door including a track mounted within a vertical wall of



said chamber, a weight within said track, means for supporting said weight at an inoperative position, a cable connected at one end to said door and at the other end to said weight, and including also an auxiliary weight smaller than said first-mentioned weight and which is attached to said cable at a point above said first-mentioned weight for preventing sagging of said cable between said door and said wall, and means responsive to said signal for rendering said supporting means inoperative whereby said urging means is brought into operation.

3,952,453
SAFETY BARRIER
Ossie Amburgey, 28445 Weddell, Trenton, Mich. 48183
Filed May 31, 1974, Ser. No. 475,349
Int. Cl.² E01F 13/00
U.S. Cl. 49—34 **8 Claims**



1. A portable safety barrier for preventing access to a restricted passageway comprising:
a bar means adapted to extend substantially across said passageway; and,
a clamp connected to at least one end of said bar means, said clamp having a generally rectangular shape and including at least a base means adapted for attachment to said bar means, a pair of side means attached to said base means and an end plate means attached to said side means at the end of said clamp furthest removed from said base means, and
at least one screw urged means for securing said clamp to a support means, said screw urged means comprising a threaded bolt means, a locking plate attachable to said threaded bolt means and a locking plate plug means receivable in said locking plate,
wherein said threaded bolt means passes through one of said side means and is threadably receivable in said locking

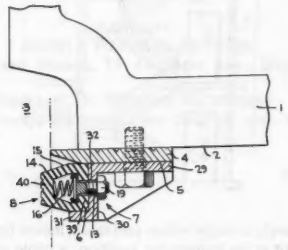
plate means, the depth of penetration of said threaded bolt means into said locking plate means being determined by the locking plate plug means, whereby said locking plate may be urged against a flat section of said support means by said threaded bolt means, thereby securing said clamp to said support means.

3,952,454

DEVICE FOR SEALING DOORS OF COKE OVEN

Osamu Sudo, Fijisawa, Japan, assignor to Nippon Oil Seal Industry Co., Ltd., Japan

Filed Aug. 2, 1974, Ser. No. 494,363
Int. Cl.[2] E06B 7/22; C10B 25/06
U.S. Cl. 49—480 4 Claims



1. A device for sealing a steel door of a coke oven comprising: a ring-shaped steel packing fitted over an outer surface of the steel door so as to contact a side wall of the coke oven when the steel door is closed; a packing retainer fitted over and joined to the outer surface of the steel packing and provided with a ring-shaped groove opened toward the side wall of the coke oven; a ring-shaped packing assembly fitted into the groove so as to press elastically against the side wall when the steel door is closed, thereby sealing the steel door; the packing assembly extending closer to the side wall of the coke oven than the steel packing and comprising an elastic member having a front section and a rear section with an opening, a spring stop disposed within the elastic member in contact with the rear section and a plurality of springs loaded between the inner side wall of the front section of the elastic member and the spring stop; the spring stop comprising a bottom section in contact with the inner wall of the rear section of the elastic member and flange sections bent inwardly from both sides of the bottom section so as to retain the springs therebetween; and each of the springs having a bottom coil of larger diameter than the remaining coils and the bottom coil being held between the flange sections of the spring stop so that the remaining coils of the springs are spaced apart from each other.

3,952,455

SEALING GASKET

Fred R. McAlarney, Seymour, Ind., assignor to The Pantasote Company, Greenwich, Conn.

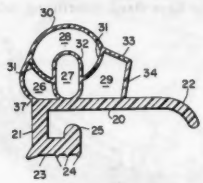
Filed Jan. 20, 1975, Ser. No. 542,392
Int. Cl.[2] E06B 7/16
U.S. Cl. 49—497 10 Claims

1. A hollow flexible sealing gasket having a uniform cross section throughout its length, said gasket being formed of plastic material and comprising in its normal unstressed condition a relatively stiff base member;

an outer cell wall extending upwardly from said base member and having spaced side wall portions and a top wall portion;

an inner central cell wall extending upwardly from said base member, said inner central wall having spaced side wall portions and a curved top wall portion, the top wall portion of said inner central cell wall curving forward and spaced from said top wall portion of said outer cell wall, said inner central cell wall defining an oblong central cell extending longitudinally upwardly from said base member;

two upwardly diverging, inner divider cell walls, each divider cell wall extending from a side wall portion of said inner central cell wall to said outer cell wall;



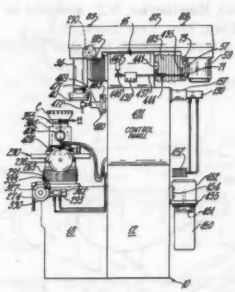
all of said cell walls being flexible and substantially more flexible than said base member, said cell walls defining said oblong central cell, a pair of side cells on either side of said oblong central cell, and a top cell above said oblong central cell and said side cells.

3,952,456

GRINDING MACHINE

Burton R. Leathley; Clifford L. Garrison; Rollo L. Garrison, and Richard F. Snyder, all of Adrian, Mich., assignors to Oliver Instrument Company, Adrian, Mich.

Filed Feb. 7, 1975, Ser. No. 548,156
Int. Cl.[2] B24B 7/00
U.S. Cl. 51—56 R 11 Claims



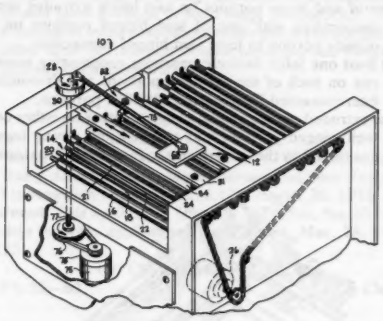
6. Apparatus for performing processing operations in effecting the grinding of the teeth of a rotatable cutting tool including, in combination, a frame construction, a reciprocable ram mounted by the frame construction, a rotatable shaft adapted to support a grinding wheel, a housing mounting the shaft and supported by the ram for movement relative to the ram, an electrically energizable motor for rotating the shaft for rotating the grinding wheel, means mounted by the frame construction for supporting a cutting tool to be ground, means for reciprocating the ram including a driving shaft having a spiral recess, ball nut means mounted on the spirally recessed portion of the shaft having operative connection with the ram, said ball nut means having spiral grooves containing bearing balls adapted for traverse in the spiral recess on the shaft for transmitting rotation of the shaft for reciprocating the ram, a hydraulically actuated rotary motor for rotating the shaft, solenoid operated valve means for directing fluid to the hydraulically actuated motor for rotating the motor, and control means for said solenoid operated valve means to effect flow of fluid in alternate directions to the hydraulically actuated motor for successively rotating the motor in opposite directions to effect reciprocation of the ram.

3,952,457

DUAL SURFACE ARTICLE ABRADING APPARATUS

Thomas Gutierrez, 395 Madison St., Santa Clara, Calif. 95050

Filed Mar. 4, 1974, Ser. No. 448,000
Int. Cl.² B24B 7/00
U.S. Cl. 51—66 9 Claims



1. Apparatus for abrading both sides of flat articles comprising,

feed means for receiving flat articles, said feed means having motive means connected thereto for advancing flat articles in a line of travel,

an abrading tool having a first carriage mounted adjacent said feed means for reciprocal motion transverse to said line of travel, said first carriage having a first pair of opposed article abrading surfaces and having a first spring means for suspending said first pair of article abrading surfaces on said first carriage in a floating upward and downward relationship to said flat articles at an elevation proximate to the line of travel of said flat articles between said pair of surfaces, and having a second spring means compressibly connecting opposed ends of said first pair of opposed article abrading surfaces, and

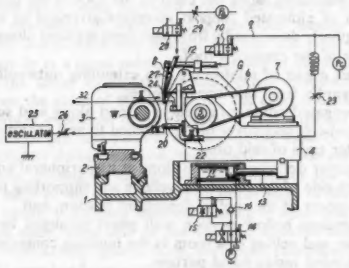
power means for providing reciprocal motion to said carriage.

3,952,458

GRINDING MACHINE WITH FEED RATE CHANGING APPARATUS

Tamaki Tomita, Okazaki; Mineo Ishikawa, Kariya; Hayashi Kodama, Kariya, and Kazuo Moriya, Kariya, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Japan

Filed July 16, 1974, Ser. No. 488,998
Claims priority, application Japan, July 17, 1973, 48-81085
Int. Cl.² B24B 49/08
U.S. Cl. 51—165.77 4 Claims



1. A grinding machine comprising:

a bed;

a wheel slide slidably mounted on said bed;

a grinding wheel rotatably mounted on said wheel slide;

a work table for supporting a workpiece;

feed means for moving said wheel slide toward and away from said workpiece;

an electric power source;

electrode means mounted adjacent to said grinding wheel and connected to said electric power source for applying a potential to the surface of said grinding wheel;

coolant means for connecting said electrode means and said grinding wheel so as to charge said grinding wheel by creating a conductive coolant film thereon;

detecting means for detecting a difference of potential between said grinding wheel and said workpiece to generate an output voltage proportional thereto at every grinding operation, said difference of potential being changeable due to the application of coolant to said grinding wheel;

memory means for memorizing the output voltage detected by said detecting means before said coolant film on said grinding wheel is engaged with said workpiece;

setting means for reducing the memorized output voltage at a predetermined rate to provide a reference voltage corresponding to a predetermined constant gap between said grinding wheel and the workpiece;

comparator circuit means for comparing the output voltage with the reference voltage to generate a feed rate changing signal when said output voltage attains said reference voltage; and

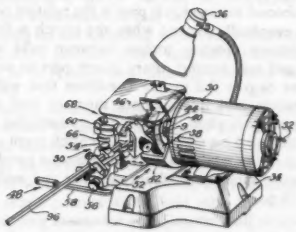
control means for controlling said feed means so as to change the feed rate of said wheel slide in accordance with said feed rate changing signal.

3,952,459

DRILL GRINDER

Marvin C. Negley, Clarinda, Iowa, assignor to Lisle Corporation, Clarinda, Iowa

Filed Oct. 29, 1974, Ser. No. 518,757
Int. Cl.² B24B 19/00
U.S. Cl. 51—219 R 2 Claims



1. In a drill grinder apparatus of the type including a support adjacent a grinding wheel, an arm pivoted to said support and thereby providing an axis of oscillation for a drill holder, a drill holder having a slot to receive said arm whereby said axis of oscillation, in all positions of the arm relative to the slot, passes through the slot, a slotted flange extending laterally from said shank, a clamp screw carried by said drill holder and coacting with the slot of said flange to retain the flange in any position of adjustment of said arm relative to said slot in said drill holder, the axis of a drill when in said holder being at an angle to the axis of said slot whereby said drill axis is variable by shifting said arm along said slot to increase the distance from the cutting end of the drill to said axis of oscillation whereby to increase the radius of the arc on which the cutting lip of a larger drill is ground as a result of swinging of said drill holder on said axis of oscillation, the improvement comprising means for adjusting and setting the angle of inclination of the

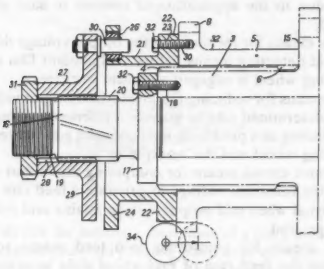
slot defined in the drill holder thereby to adjust the lip clearance angle of the drill, said means for adjusting including a block defining said slot, said block being pivotally attached to said drill holder and including fastening means for retaining said block in a fixed pivotal position.

3,952,460

METHOD OF MANUFACTURE OF TOOTHED CLUTCHES

Herbert Arthur Clements, Weybridge, England, assignor to S.S.S. Patents Limited, London, England

Filed Aug. 5, 1974, Ser. No. 494,869
Claims priority, application United Kingdom, Aug. 28, 1973, 40420/73
Int. Cl.² B24B 1/00
U.S. Cl. 51—323 2 Claims



1. A method of manufacturing a toothed clutch of the type comprising a first rotary clutch part provided with clutch teeth, a second rotary clutch part, and an intermediate member which is provided with clutch teeth and is slidably connected to said second rotary clutch part via interengaged splines so as to be capable of movement relative to said second rotary clutch part to bring the clutch teeth of said intermediate member into and out of interengagement with the clutch teeth of said first rotary clutch part, the improvement including the steps of assembling together said intermediate member and said second rotary clutch part in the relative positions that they will eventually assume when the clutch is fully engaged and thereupon creating torque between said intermediate member and said second rotary clutch part to simulate in at least some degree the torque condition that will eventually exist between said intermediate member and said second rotary clutch part when the clutch is transmitting torque, and grinding the working surfaces of the clutch teeth of said intermediate member whilst such created torque condition is present between said intermediate member and said second rotary clutch part.

3,952,461

MULTI-LAYER WALLS FOR FRAMELESS BUILDINGS FORMED FROM EXTRUDED ALUMINUM OR PLASTIC INTERLOCKING WALL ELEMENTS

Lewis R. Kinsey, 108 S. 25th St., Phoenix, Ariz. 85034

Filed Dec. 26, 1974, Ser. No. 536,449
Int. Cl.² E04B 7/00, 1/343
U.S. Cl. 52—57 2 Claims

1. A metallic building erected from interlocking elements comprising in combination:

a sill plate for mounting on a substantially horizontal surface,

a slipper guide longitudinally positionable in said sill plate,

tie-rods demountably secured to and extending vertically upwardly from said slipper guide,

a series of upstanding, interlocking elongated wall extrusions supported on their ends side by side on said sill plate, embracing said vertical tie-rods at the interlocking junction of said wall extrusions and comprising an inside portion and an outside portion,

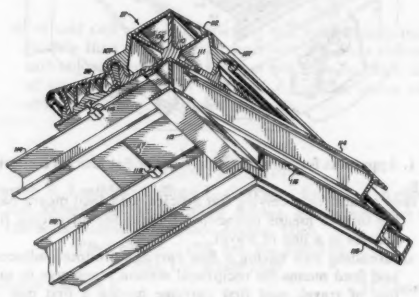
said inside and outside portions defining cooperating demountable hinge connections,

each of said hinged connections comprising a pair of hinge portions spacedly arranged on the inside extruded portion and on the outside extruded portion,

one of said hinge portions on said inside extruded portion cooperating with one of said hinged portions on said outside portion to form said hinged connection,

at least one latch device comprising cooperating members one on each of the extruded portions and demountably interconnected between the extruded portions,

the extruded portions being swung together on either one of their hinged portions and snapped and swung together positioned by the latch device to form the wall extrusions,



an eave plate secured by clamping means on the upper end of said tie-rod to the top of said wall extrusions,

floor extrusions supported on horizontally inwardly projecting flanges of said sill plate,

the inside portions of said wall extrusions extending vertically the height of a room of the building, with the surfaces of said inside portions serving as the inside wall of the room and the upper ends of said inside portions serving as a support for a second story floor of said building,

outside portions of further wall extrusions being positioned in end-to-end alignment with said outside portions of said wall extensions forming the first floor of the building,

inside portions of said further wall extrusions arranged in spaced end-to-end alignment with said inside portions forming a part of the first floor wall extensions to form the walls of the rooms of the second floor of the building,

a ceiling for the rooms in the building mounted on the upper ends of said inside portions of said further wall extensions,

said further wall extrusions and said ceiling supporting a roof comb,

a roof comb comprising an elongated crest member fitted for extending along the crest of the roof of the building,

a pair of elongated support members arranged to extend angularly downwardly from said crest member along each side of the crest of a roof,

at least a pair of reinforcing ribs extending outwardly and upwardly from said crest member,

an elongated cover arranged to extend along said support members, said cover being fastened to and enclosing the outer ends of said ribs,

said cover defining back portions at its peripheral edge on each side of the crest for receiving and supporting roofing members of the roof in dependent fashion, and

a frameless hollow portion wall panel arranged between floor and ceiling of a room in the building comprising an extruded inside panel portion,

an extruded outside panel portion parallelly positioned to said inside panel portion,

inner portions arranged between said inside and said outside

panel portions with one juxtapositioned to each of said inside and outside panel portions,

each of said inside and outside panel portions and inner portions comprising a pair of hinge elements spacedly arranged thereon,

said hinge elements on said inside and outside panel portions cooperating with hinge elements on a different one of said inner portions to form hinge connections,

the combined inner portion and inside panel portion and the other inner portion and outside panel portion forming a pair of cooperating wall layers.

3,952,462

PANEL WALL SYSTEMS

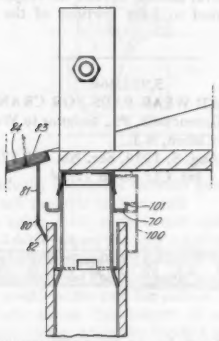
Jack Darcy Heise, Mount Maunganui, New Zealand, assignor to Barry Albert Beazley, Mount Maunganui, New Zealand

Continuation of Ser. No. 236,121, March 20, 1972, abandoned. This application May 20, 1974, Ser. No. 471,711

Claims priority, application New Zealand, Mar. 18, 1971, 163125

Int. Cl.² E04B 2/72, 2/74

U.S. Cl. 52—62 4 Claims



1. A panel wall system including a plurality of panels, each panel comprising at least two spaced upright members having upper and lower ends and two spaced horizontal members interconnected to the upright members inwardly of the upper and lower ends of the upright members to provide upper and lower extensions for each upright member, each upright member having a base and parallel sides extending normal to the base, each horizontal member having a base and parallel sides extending normal to the base, said upright and horizontal members constituting a frame and cladding sheets fixed to the sides of the upright members and horizontal members inwardly of the horizontal members, a base plate having a base and parallel sides extending normal to the base, each side of the base plate being provided with axially spaced slots, the lower extension of each upright member having an ear cracked out of each side thereof adjacent the base whereby the ears lie in a plane substantially parallel to the plane of the base, the lower extensions of the upright members fitting between the sides of the base plate, the ears of each side of each lower extension being engaged in two adjacent slots in the sides of the base plate by expanding the sides of the base plate slightly during insertion, the sides of the base plate, after insertion, closing to engage suitable edges of the ears, an upper edge of the ears engaging an upper edge of the slots to resist uplift, a capping member having a base and spaced parallel sides, each side of the capping member being provided with axially spaced slots, the upper extension of each upright member having an ear cracked out of each side adjacent the base whereby the ears lie in a plane substantially parallel to the plane of the base, the upper extensions of the upright members fitted between the sides of the capping member, the ears of each side of each upper extension being engaged in two adjacent slots in the sides of the capping member by expanding the sides of the capping members slightly during insertion, the sides of the capping member, after insertion, closing to engage suitable edges of the ears, a lower edge of the ears of the upper extensions engaging an upper edge of the slots of the capping member to resist uplift, each side of the base plate and capping member, at its free end, being turned to provide a substantially U-shaped member, and flashing provided in operative arrangement with one of the U-shaped members of each of the base plate and capping member.

3,952,463

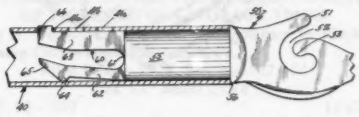
FLEXIBLE COVER SUPPORT STRUCTURE

Duane W. Lane, Charlotte, Mich., assignor to General Aluminum Products, Inc., Charlotte, Mich.

Filed May 29, 1974, Ser. No. 474,314

Int. Cl.² E04B 1/12

U.S. Cl. 52—63 4 Claims



1. In a collapsible enclosure having a series of wall panels hingedly connected at their upright edges and arranged in a closed polygon; a dome-shaped framework above said panels including a series of outwardly and downwardly curved interconnected tubes, the tubes including means at their outer ends for engaging said panels to retain the framework in compression; and, a flexible roof overlying said framework, said roof being interlocked at circumferentially spaced points with said engaging means; the improvement comprising: said tubes having at least two apertures adjacent the outer extremity thereof, means for adjusting the effective length of said tubes and engaging means whereby variations in the size of said roof can be accommodated,

said engaging means being integrally molded from plastic and including a shank portion telescopically slidable within the extremities of said tubes,

said adjusting means including means for restraining sliding of said shank portion within said tube when said shank portion is in at least two differing positions within said tube, and

said restraining means comprising a pair of spaced resilient legs attached to said shank portion and extendible into said tube therewith, detent means extending from one of said legs so as to be resiliently urged into one of said apertures when aligned therewith, for restraining sliding of said shank portion within said tube, the other of said legs including means for engaging the wall of said tube to compress said legs toward one another, the distance between said engaging means and said detent exceeding the diameter of said shank and the inner diameter of said tube prior to insertion of said restraining means into said tube.

3,952,464

VEHICLE CUPOLA STRUCTURE AND LIFT MEANS

Adam Edward Stupak, 10027 Baltic Ave., Cleveland, Ohio 44102

Filed Jan. 22, 1974, Ser. No. 435,480

Int. Cl.² E04B 7/16

U.S. Cl. 52—72 1 Claim

1. A power operated collapsible cupola for a vehicle and comprising

a quadrilateral top,

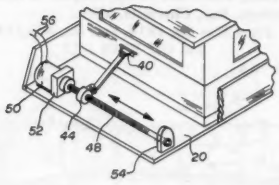
a pair of rectangular sides of the same length as said top and hingedly secured to the side edges thereof, each of said

sides formed from two longitudinally extending pieces hinged together along their adjacent edges so that said sides break inwardly under said top when said top is lowered,

a pair of ends of the same width as said top and hingedly secured thereto at the ends thereof, said ends and sides being of the same height, said ends being formed in top and bottom pieces hingedly secured together at their adjacent edges,

a control means pivotally secured to each of the bottom pieces of said ends, said control means each including a member having a tapped aperture therein,

a threaded control rod for each of said control members and each operably engaging a said aperture in one of each



control members, said control rods being horizontally positioned adjacent said ends and extend transversely of the cupola,

drive means engaging said control rods for rotating them to move said ends, sides, and top to raised operative positions and for retracting them to lowered inoperative positions, and

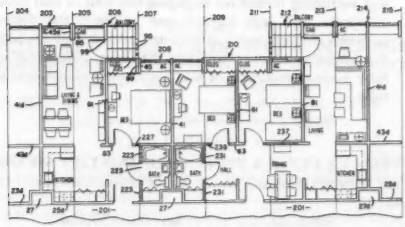
said control means including a connector link hingedly and pivotally connected at one end to said bottom end piece, and hingedly and pivotally secured at its other end to said control member for raising and lowering said cupola by axial movement of said control member, the pivotal positioning of said connector link permitting movement thereof in a direction extending transversely of the cupola.

3,952,465

BUILDING STRUCTURE FORMED OF MODULAR UNITS WITH CANTILEVERED PORTIONS FOR FORMING A CORRIDOR FLOOR

Dominic J. Masiello, Rochester, N.Y., assignor to Dominic Joseph Masiello and Louise A. Masiello, both of Rochester, N.Y.

Filed Mar. 19, 1971, Ser. No. 125,939
Int. Cl.[2] E04B *1/348*
U.S. Cl. 52—73 **1 Claim**



1. A habitable building structure comprising a series of separate living areas intended for occupancy by different persons, said living areas being formed at least mainly from a series of separate modular units assembled in side by side relation to each other, said modular units being of a plurality of different kinds, at least some of said modular units each having a rigid floor slab portion and a corridor wall portion rising from and formed integrally with the floor slab portion, adjacent modular units being assembled with their respective corridor wall portions in alignment with each other and with the respective side edges of the floor slab portions substantially engaging each other, the respective modular units extending from a composite corridor wall in a direction perpendicular to such corridor wall to an outer end arranged generally parallel to said corridor wall, at least some of said modular units having an approximately central wall portion rising from and formed integrally with the floor slab portion of that unit and extending from said corridor wall to said outer end in a position set materially inwardly from both lateral edges of that modular unit so that a substantial part of the floor area of that modular unit lies on each side of said central wall portion, each of said separate living areas being formed in part from that portion of one modular unit lying on one side of its central wall portion and that portion of an adjacent modular unit lying on the adjacent side of its central wall portion, a series of said modular units being assembled in a row on one side of a corridor, another series of modular units being assembled in a second row on the opposite side of the same corridor, the floor slab portions of certain of said modular units being extended in cantilever fashion beyond the respective corridor wall portions thereof to form portions of the floor of the corridor.

3,952,466

SPRING-LOADED WEAR PADS FOR CRANE BOOMS

Stanley R. Spain, Greencastle, Pa., assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Aug. 8, 1974, Ser. No. 495,770
Int. Cl.[2] E04H *12/34*
U.S. Cl. 52—118 **10 Claims**

1. In a crane boom having relatively movable telescopic sections including at least one circumscribing boom section having a top plate which is subject to transverse bending moments and stresses during normal operations and a pair of side plates connected therewith, the improvement comprising a pair of upper wear pads arranged between said telescopically interfitting boom sections, means connected to the interior boom section of said interfitting pair of boom sections and supporting such wear pads on the interior boom section in sliding contact with said top plate of said circumscribing boom section, said wear pads slidably connected on said supporting means for lateral sliding movement relative thereto and to said boom sections, and wear pad expander means connected between and in contact with said wear pads and constantly expanding the wear pads laterally relative to the interior boom section and urging the outer sides of the wear pads into sliding contact with the side plates of said circumscribing boom section at the connection of the side plates with the top plate thereof.

3,952,467

EXTENDIBLE TOWER STRUCTURE

Jackson A. Partlow, Rock Hill, S.C., assignor to Zip-Up Lighting Tower Company, Inc., Spartanburg, S.C.

Continuation of Ser. No. 121,443, March 5, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,064
Int. Cl.[2] B66C *23/06*; E04H *12/34*
U.S. Cl. 52—121 **11 Claims**

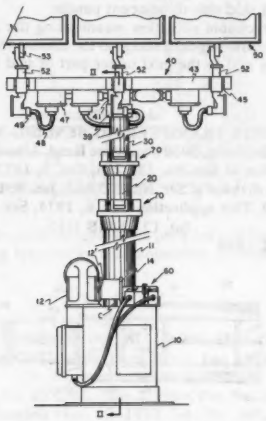
1. An extendible tower comprising:

a. a base section;

b. at least one intermediate section associated with said base section, each intermediate section being nestable within

a next larger section, said base and said at least one intermediate section having rotatable pulleys received within the upper and lower ends thereof, all of said upper pulleys being mounted in a plane normal to the plane of said lower pulleys,

c. a top section, said top section being nestable in the next adjacent intermediate section and having a rotatable pulley received in a lower end thereof and cable securing means received in an upper end thereof;



d. an individually adjustable external guide means for each side of each nestable section; and

e. a single cable drive system, said system comprising a cable and drive means therefor, said cable being secured to said drive means, passing partially around said pulleys and an opposite end thereof being secured to said cable securing means within said top section, said cable passing substantially across the bottom of each intermediate section and being internally located all along said sections.

3,952,468

ASSEMBLY OF PREFABRICATED PRESTRESSED CONCRETE ELEMENTS WITH THE USE OF A POSTSTRESSING LINK MEANS

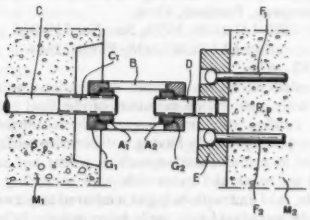
Rene Soum, 2, rue Joliment, 31 Toulouse, France

Continuation of Ser. No. 310,163, Nov. 28, 1972, abandoned. This application May 1, 1974, Ser. No. 465,948

Claims priority, application France, Jan. 4, 1972, 72.00691

Int. Cl.² E04C *2/06, 5/12, 3/26*

U.S. Cl. 52—227 **8 Claims**



1. An assembly of prefabricated pre-stressed reinforced concrete elements, wherein each element comprises reinforcing members solid with said element and subjected to predetermined amounts of stress applied before the assembling of the elements, said assembly comprising a plurality of linking means rendering said assembly statically indeterminate through applying selectively to any reinforcement of an element supplemental stress independently of said predetermined stress, said linking means being respectively provided between any couple of said concrete elements, and each comprising: a first and a second cages (*3a*, *3b*, FIG. 3), each cage having opposite opened-ends, a first externally threaded rod made integral with one of said elements of said couple and threaded into said first cage, a second externally threaded rod made integral with the other one of said elements of said couple and threaded into said second cage, a third rod having a first and a second externally threaded extremities respectively inserted in opened ends of said first and second cages, and a first and second nuts screwed respectively in said cages onto said first and second extremities and abutting respectively against said cages by means of ball-and-socket bearings.

3,952,469

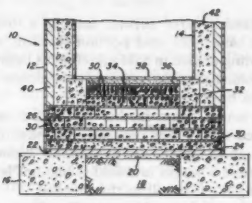
METHOD AND APPARATUS FOR CAPPING CELLULAR GLASS BLOCKS FOR THE LOAD BEARING INSULATION OF LIQUEFIED GAS STORAGE TANKS

Stanley J. Dudzinski, Trafford, Pa., assignor to Pittsburgh Corning Corporation, Pittsburgh, Pa.

Filed Feb. 6, 1975, Ser. No. 547,754

Int. Cl.² B65D *25/18*

U.S. Cl. 52—249 **12 Claims**



1. Load bearing insulation for the base of a liquefied gas storage tank having a cylindrical outer wall spaced from a cylindrical inner wall comprising,

first support means for supporting said tank outer wall, said first support means having an upper horizontal surface,

a plurality of horizontally positioned insulation blocks arranged in layers on said first support means upper horizontal surface within said tank outer wall, said layers of insulation blocks each having an upper horizontal surface,

a capping layer of irreversibly compressible inorganic particulate material applied to each horizontal surface of said layers of insulation block to form a load bearing insulation therefor, and

second support means for supporting said tank inner wall and said tank base.

3,952,470

FURNACE LINING APPARATUS

Carlisle O. Byrd, Jr., Houston, Tex., assignor to J T Thorpe Company, Houston, Tex.

Filed June 3, 1974, Ser. No. 475,439

Int. Cl.² E04B *1/80*

U.S. Cl. 52—509 **8 Claims**

1. An apparatus for lining a wall of a furnace and like equipment, comprising:

a. a folded ceramic fiber blanket having a fold formed in a central portion thereof and having two end portions thereof folded together and extending from said fold for insulating the furnace;

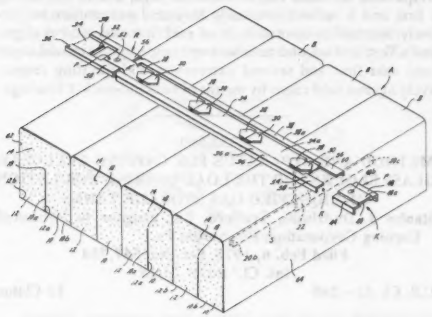
b. a support beam mounted extending along the length of said fold in said folded blanket, said folded end portions

of said folded blanket also extending inwardly from said support beam to assist in insulating said support beam;

c. a suspension arm having said support beam mounted therewith at a position on said support beam within said fold in said folded blanket;

d. said suspension arm extending from an inner end portion in said fold through said central portion of said folded blanket to an outer end portion;

e. an attachment beam for mounting with the wall of the furnace, said attachment beam having a mounting orifice formed therein;



f. said suspension arm further having a mounting lug, formed at said outer end portion thereof, inserted into said mounting orifice in said attachment beam for attaching said folded blanket and said suspension arm to said attachment beam; and

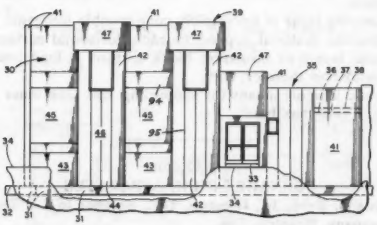
g. said attachment beam further having connecting openings formed therein for passage of connecting members therethrough to attach said attachment beam to the wall of the furnace wherein said folded blanket forms an insulating lining for the wall of the furnace.

3,952,471

PRECAST WALL PANEL AND BUILDING ERECTED ON SITE THEREFROM

Edward L. Mooney, 468 Webster St., Manchester, Mass. 03101

Filed Aug. 5, 1974, Ser. No. 494,772
Int. Cl.² E04B 5/04, 1/00
U.S. Cl. 52—602 14 Claims



1. A pre-fabricated wall panel, adapted to be erected with similar panels to form the vertical side wall of a building, said panel comprising:

a pre-cast concrete slab of predetermined height and width extending vertically from an integral subground level, portion, supported on the building footing, to an integral above ground portion for at least one story above ground level, thereby combining in one piece both an upstanding foundation wall and an integral, unitary upstanding, side wall;

said slab being load bearing and having a main body of predetermined thickness and substantial width with a pair of spaced apart, projecting, integral, vertical side edge flanges of increased thickness substantially twice the predetermined thickness of said main body forming integral reinforced concrete vertical columns for resisting compressive stresses with a vertically extending shallow recess therebetween free of intermediate cross flanges;

vertical joint connecting and sealing means along each said vertical side edge flange for structurally affixing and sealing said slab to adjacent panels;

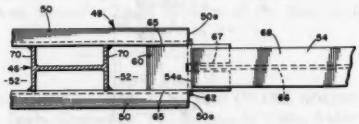
quick attachable affixation means along the horizontal top and bottom edges of said slab for affixing the same to said footing and to the next upper part of said building.

3,952,472

JOINT FOR TRANSFERRING BENDING MOMENTS

Robert L. Boehmig, 3030 Peachtree Road, Atlanta, Ga. 30305

Continuation of Ser. No. 295,216, Oct. 5, 1972, abandoned, which is a division of Ser. No. 103,665, Jan. 4, 1971, Pat. No. 3,722,169. This application Dec. 6, 1974, Ser. No. 530,450
Int. Cl.² E04B 1/35
U.S. Cl. 52—648 13 Claims



1. A joint for transferring bending moments comprising:

an elongated rigid continuous beam structure comprising first and second elongated main beam members disposed in longitudinally aligned relationship to one another and terminating, respectively, in first and second ends spaced apart longitudinally to define therebetween an elongated gap for accomodating a vertical column, and a pair of elongated spanning beam portions of sufficient length to span said gap disposed in opposed spaced relationship to one another and defining the sides of said gap, said spanning beam portions being attached to said main beam members by moment connections to provide a continuous rigid beam structure across said gap;

a vertical column extending through said gap, the cross-sectional dimensions of said vertical column and said gap being such that said beam structure is relatively movable with respect to said column so as to be relocatable vertically along said column; and

fastening means connecting said column to said spanning beam portions.

3,952,473

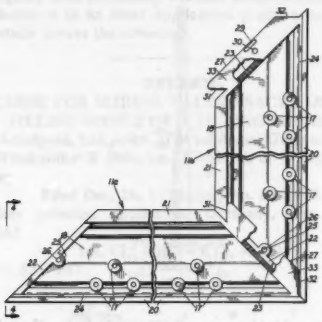
UNIVERSAL FRAME MEMBER

Edwin L. Jesse, West Caldwell, N.J., assignor to Evans Products Company, Portland, Oreg.

Filed Oct. 30, 1974, Ser. No. 519,066
Int. Cl.² E04C 2/38; F16B 12/44
U.S. Cl. 52—656 7 Claims

1. A universal frame member designed to be assembled together with other frame members of identical cross-section and end configuration into a generally rectangular-shaped frame comprising a body having a decorative surface and an under side to said decorative surface, a first and second end wall and an inner and outer side wall extending from said under side, said end walls being at a mitered angle with respect to the side walls, said side walls being relatively longer than said end walls, a flange extending perpendicularly outwardly from a first of said end walls, at least one fastening means receiving receptacle located along the second of said end walls, and means located on said flange for effecting a snap lock fit when two or more of said frame members are assem-

bled together, said means for effecting a snap lock comprising a lug member extending perpendicularly downwardly from said flange at a location spaced outwardly from said first of



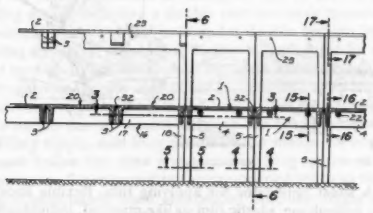
said end walls to press fit against the periphery of the fastening means receiving receptacle of an adjacently positioned frame member.

3,952,474

METHOD OF ASSEMBLING BUILDING STRUCTURES

Edward K. Rice, 2077 Linda Flora Drive, Los Angeles, Calif. 90024

Division of Ser. No. 837,986, June 2, 1969, Pat. No. 3,744,200. This application Mar. 12, 1973, Ser. No. 340,391
Int. Cl.[2] E04B 1/348; E04G 21/14
U.S. Cl. 52—747 4 Claims



1. A method of assembling a multiple story building utilizing precast concrete modules each having one elongated slab and at least one beam extending the length thereof and legs at the ends of the beam, the legs having free lower ends terminating in generally planar end surfaces and having vertical tendon guideways extending therethrough and through the ends of the beams and slabs, the method characterized by:

a. preparing a foundation with tendons each having an end anchored therein;

b. raising a module over said foundation sufficiently to permit threading corresponding anchored tendons in its guideways;

c. threading said tendons through said guideways;

d. lowering said module along said threaded tendons until said end surfaces abut a supporting surface;

e. raising and lowering succeeding modules and threading said tendons through the guideways thereof to form a stack of modules, wherein the legs of succeeding modules rest on the slabs of preceding modules;

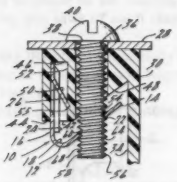
f. and applying tension force throughout the length of each tendon protruding from the uppermost module and reacting said tension force against the uppermost module to simultaneously apply throughout the stack of modules a corresponding compression force sufficient to provide a frictional bond between the end surfaces of the legs of the modules with respect to the underlying surface of the foundation and preceding modules.

3,952,475

FASTENER AND JOINT FORMED THEREWITH

Joseph H. Paskert, Lakewood, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Division of Ser. No. 526,887, Nov. 27, 1974. This application May 9, 1975, Ser. No. 576,391
Int. Cl.[2] F16B 5/02
U.S. Cl. 52—758 F 2 Claims



1. Means for joining a cover plate to a housing comprising:

A. a plurality of screws;

B. a plurality of clearance holes formed through said cover plate for receiving said screws;

C. a plurality of bosses disposed at the periphery of said housing, registering with said cover plate clearance holes and having clearance bores formed therethrough for receiving said screws, each of said bosses including:

1. an edge surface substantially parallel to the axis of said clearance bore,

2. a substantially flat, top flange surface adjacent said plate and having disposed thereon

a. a raised bearing surface extending inwardly from the periphery of said boss and a slot extending from said edge surface encompassing said clearance bore; and

b. a raised, semicircular retaining surface disposed at the inner periphery of said clearance bore and spaced radially inward from said bearing surface,

3. an inclinded bottom surface forming an acute included angle with said innermost edge;

and

D. a plurality of generally U-shaped resilient clips engaging said bosses, each of said clips comprising:

1. a straight side portion adapted to abut said edge surface;

2. a top, retaining portion extending perpendicularly from said side portion and having an aperture formed therethrough, and receiving said semicircular retaining surface to prevent movement of said clip toward said edge; and

3. a bottom, locking portion resiliently extending from said side portion having an aperture formed therethrough sized to receive said screw and having a relaxed position wherein said locking portion is disposed in an angular relationship relative to the axis of the clearance bore such that the axis of said aperture describes an acute angle with the axis of the clearance bore; and being movable

a. in response to the insertion of said screw through said clearance bore to a loaded position wherein the axis of said aperture is more nearly coincident with the axis of said clearance bore to operatively engage said locking portion, thereby allowing the ratcheting passage of said screw; and being further movable

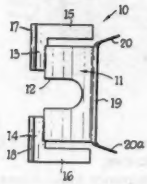
b. in response to tightening engagement of the screw to a locked position intermediate said relaxed and loaded positions wherein the surfaces of the locking portion adjacent the through bore threadedly engage the screw.

3,952,476

BEADING CLIP

Barry Roger Michael Barnett, West Drayton, and Edward Harry Frederick Ferguson, Harefield, both of England, assignors to TRW Inc., Cleveland, Ohio

Filed Apr. 25, 1974, Ser. No. 463,945
Claims priority, application United Kingdom, May 25, 1973, 25093/73
Int. Cl.² F16B 1/00
U.S. Cl. 52—760 3 Claims



1. A sheet metal clip for attaching a beading to a support having a headed stud shank attached to and projecting outwardly from a surface of the support with the stud head being spaced from the support, the clip comprising an arcuate body portion having a stud shank receiving slot formed therein and opening out of one side thereof, at least one support surface engaging, substantially planar leg joined to said one side of the arcuate body portion and extending toward the opposite side thereof and being axially spaced from the remainder of said body portion a distance which is not less than the length of the stud shank so that said body portion is depressed toward the plane of the leg and tensioned against the undersurface of the stud head by the leg when the stud shank is seated in the slot in said body portion, and abutment means for clamping the edges of a beading to the support, said abutment means being joined to each side of said body portion, portions of the abutment means on one side of the body portion lying substantially in the plane of said leg and the abutment means on the opposite side of said body portion being located substantially above the plane of said leg.

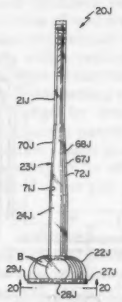
3,952,477

METHOD OF MAKING A PACKAGE CONSTRUCTION FOR BASEBALL TYPE PLAYING COMPONENTS

James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429, and Joseph V. Tassone, 2425 Rawnsdale Road, Kettering, Ohio 45440

Continuation-in-part of Ser. Nos. 320,206, Jan. 2, 1973, Pat. No. 3,819,038, and Ser. No. 326,805, Jan. 26, 1973, Pat. No. 3,830,362. This application June 21, 1974, Ser. No. 481,776
Int. Cl.² B65B 5/04
U.S. Cl. 53—3 9 Claims

1. A method of making a package construction comprising the steps of providing a tubular baseball and softball tee member having a chamber therein of a size to accommodate an entire bat of a conventional baseball or softball ballbat configuration, providing a bat of generally conventional baseball or softball ballbat configuration for hitting a ball off of said tee member, and telescopically disposing the entire said bat into



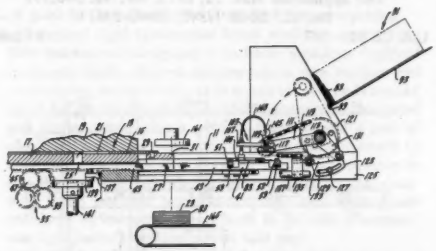
said chamber of said tee member to provide a self-contained package construction thereof.

3,952,478

VACUUM SHEET APPLICATOR

Louis R. Richards, Mokena, and Kenneth F. Sandberg, Lockport, both of Ill., assignors to Formax, Inc., Mokena, Ill.

Filed Oct. 10, 1974, Ser. No. 513,737
Int. Cl.² B65B 25/08, 41/06
U.S. Cl. 53—122 30 Claims



1. A sheet applicator for applying thin, flexible sheets of paper, cellophane, plastic film or like material, individually, to a series of hamburger patties or like flat articles of given surface configuration, as the articles traverse a given discharge path in sequential spaced relation to one another, the sheet applicator comprising:

a vacuum transfer shuttle reciprocally movable along a shuttle path between a sheet application position intersecting the article discharge path and a sheet transfer position adjacent to, but spaced from the discharge path,

the shuttle having a central opening which encompasses the article discharge path, through which one of the articles may pass freely, when the shuttle is in its application position,

the shuttle including at least three small vacuum grippers distributed around the peripheral edges of the central opening in the shuttle, just beyond the edges of an article passing therethrough, with said vacuum grippers being distributed around at least a major portion of the peripheral edges of said central opening;

a sheet feeder, including releasable sheet holder means, for depositing a single, thin, flexible sheet on the shuttle in registry with the shuttle vacuum grippers whenever the shuttle reaches its sheet transfer position, each sheet being of a size and configuration to cover all of the shuttle vacuum grippers; and

actuating means for actuating the shuttle and the sheet feeder in synchronism with the movement of the articles

along the discharge path and in synchronism with each other, so that the sheet holder means of the sheet feeder releases each sheet as it arrives at the transfer position in registry with the shuttle vacuum grippers and so that the shuttle is in its sheet application position each time an article moves therethrough.

3,952,479

MACHINE FOR SLIDING VALVED SACKS ONTO THE FILLING NIPPLE OF A FILLING MACHINE

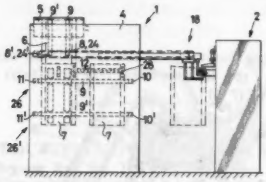
Fritz Achelpohl, Lengerich of Westphalia, Germany, assignor to Windmoller & Holscher, Lengerich of Westphalia, Germany

Filed Dec. 26, 1974, Ser. No. 536,473

Claims priority, application Germany, Jan. 4, 1974, 2400265

Int. Cl.² B65B *43/12, 43/30*

U.S. Cl. 53—187 **8 Claims**



1. An apparatus for placing valved sacks onto the filling nipple of a filling machine, comprising storage means for valved sacks having a valve in the side wall of the sack, means for feeding the valved sacks individually in a vertical position with the valve positioned at the upper end of the sack, said feeding means including a double belt conveyor mounted for movement about vertical axes and a double suction belt for opening the valve, said double suction belt mounted for movement parallel to the double belt conveyor at the vertical level of the valve in the side wall of the sack, guide means mounted parallel to the filling nipple, and tong means mounted on the guide means for movement between the feeding means and the filling nipple, said tong means having means for engaging the sack below the valve and spreading tong means carrying finger means for engaging in the pre-opened valve so that the valve is maintained open and placed onto the filling nipple during the movement of said tong means.

3,952,480

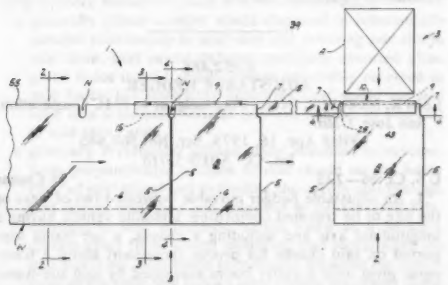
PACKAGING APPARATUS

John E. Nordstrom, Two Rivers, Wis., assignor to Hayssen Manufacturing Co., Sheboygan, Wis.

Filed Apr. 28, 1975, Ser. No. 572,094

Int. Cl.² B65B *5/02, 43/30, 47/06*

U.S. Cl. 53—187 **24 Claims**



1. Packaging apparatus comprising means for feeding bags sidewise to a loading station, each bag being an open mouth bag and each wall of the bag having a flap at its mouth end;

a pair of clamps at the loading station for clamping the flaps, each clamp comprising a pair of jaws movable relatively to one another between an open position for sidewise entry of a flap therebetween and a closed position for clamping the flap;

means mounting the clamps for movement relatively to one another between a flap-receiving position wherein the clamps are relatively close together and a bag-opening position wherein the clamps are spread apart, said clamps when in flap-receiving position with their jaws open being adapted for sidewise entry therein of the flaps of a bag as the bag is fed sidewise to the loading station;

means for closing the jaws of each clamp for clamping the flaps;

means for moving the clamps relatively to one another with the flaps clamped therein to said bag-opening position for opening the bag; and

means at the loading station for loading the opened bag.

3,952,481

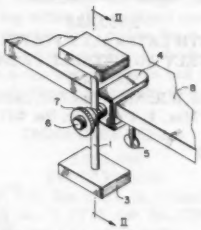
CONTAINER LOADING DEVICE

Anders Albertsen, Leonardo, N.J., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 9, 1975, Ser. No. 539,645

Int. Cl.² B65B *67/04*

U.S. Cl. 53—392 **6 Claims**



1. A container loading and unloading device for attaching to a counter surface comprising:

a. a support arm having a first end and a second end opposite each other;

b. a clamp means rotatably mounted to the support arm between the first end and the second end and fixedly attached to the counter surface in such a manner that the support arm rotates in a vertical plane, wherein the clamp means is comprised of:

i. a U-shaped channel having a first side and a second side parallel to each other and a third side perpendicular to the first side and the second side;

i.i. a clamp screw passing through the first side for fixedly attaching the clamp means to the counter surface;

i.i.i. a shaft passing through the third side for rotatably mounting the support arm to the clamp means; and

i.v. a shaft nut screwably attached to the shaft for preventing axial motion of the support arm on the shaft;

c. a first pedestal attached to the first end of the support arm; and

d. a second pedestal attached to the second end of the support arm;

each said pedestal being adapted in turn to support an article with a bag thereover and the device being arranged to unload the bagged article from the pedestal when the support arm is rotated in the vertical plane.

3,952,482

BUTT LIFTING ROLLER FOR SUGAR CANE HARVESTERS

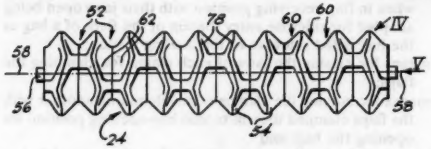
Donald Jonathon Quick, Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Oct. 4, 1974, Ser. No. 512,274

Claims priority, application United Kingdom, Oct. 13, 1973, 47911/73

Int. Cl.² A01D *45/10*

U.S. Cl. 56—13.9 4 Claims



1. A sugar cane harvester comprising base cutting means capable of severing canes from their roots, a rotatable feed member positioned adjacent the base cutting means to intercept canes severed by the base cutting means, and drive means capable of rotating the feed member, characterized in that the feed member includes spaced corrugated discs that form ridges which define grooves extending around its axis of rotation with a width that varies from place to place along the length of said grooves, the dimensions of each groove being such that the end of a cane stick can at least partially enter therein.

3,952,483

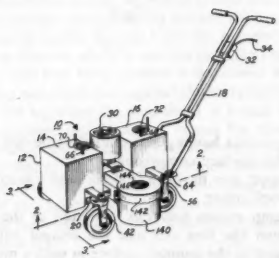
TRIMMER WITH LATERALLY POSITIONED BLADE AND SEPARATELY ADJUSTABLE FRONT AND REAR WHEELS

Dean H. Masterson, R.R. No. 5, Box 467, LaPorte, Ind. 46350

Filed Mar. 1, 1974, Ser. No. 447,069

Int. Cl.² A01D *35/262*

U.S. Cl. 56—17.2 5 Claims



1. A lawn trimmer comprising a frame having a lateral extension on only one side, forward and rearward wheel means supporting said frame above the ground and being disposed forwardly and rearwardly of said frame extension, said forward wheel means including a transversely disposed cross member and a caster mounted on each end of said member and said rearward wheel means including a transversely disposed cross member and a wheel mounted on each end of said member, a rotary blade mounted on said frame extension near the outer end thereof for rotation on a substantially horizontal plane and being disposed principally laterally outwardly from each wheel means, a motor on said frame, power transmission means interconnecting said motor and blade, an adjustment means for said forward and rearward wheel means for adjusting the said frame vertically relative to said wheel means and said blade relative to the ground, each said adjustment means including a vertically extending screw rotatably secured to said frame, a nut fixed to the respective one of said members, said screw and nut being threadedly connected, and means for manually rotating said screw, whereby said frame may be vertically adjusted by rotating said screws.

3,952,484

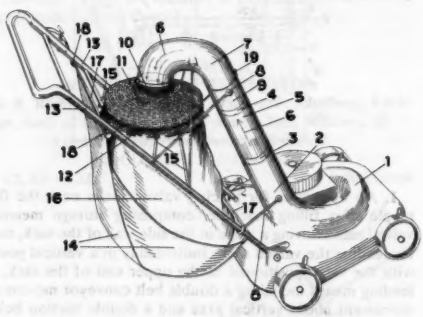
LAWN MOWER

Earl C. Van Swearingen, 5714 Driftwood Parkway, Cape Coral, Fla. 33904

Filed May 14, 1974, Ser. No. 469,880

Int. Cl.² A01D *35/22*

U.S. Cl. 56—202 1 Claim



1. An improved lawn mower of the rotary cutter type having a rotary cutter housing, handles to guide said lawn mower, said handles attached to and projecting upwardly from said rotary cutter housing, a substantially horizontal circular bag holding frame attached to said handles, a cut grass elevating tube carried by said rotary cutter housing, said tube curved near its upper grass outlet end to deliver cut grass substantially vertically downward into a cut grass circular bag recepticle, a circular air release mesh surrounding and attached to said tube and attached to said circular bag holding frame and fastening means fastening said circular mesh and said circular bag to said circular bag holding frame, said elevating tube extending upwardly above said air release mesh and curved downwardly with its outlet end entering said air release mesh substantially centrally therein.

3,952,485

ADJUSTABLE HEDGER

Leon R. McRobert, Ocoee, Fla., assignor to FMC Corporation, San Jose, Calif.

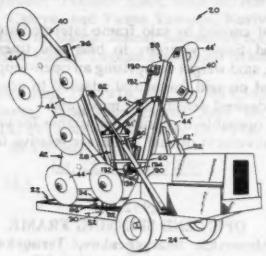
Filed Apr. 16, 1975, Ser. No. 568,645

Int. Cl.² A01D *55/18*

U.S. Cl. 56—235 15 Claims

1. An adjustable hedger movable between rows of trees or the like to be trimmed comprising; a mobile vehicle having a longitudinal axis and including a chassis, a sub-frame supported on said chassis for pivotal movement about a transverse pivot axis, a cutter boom supported by said sub-frame for translatory movement parallel to said transverse pivot axis and for pivotal movement in a transverse plane containing said

transverse pivot axis, rotatable cutter means on said boom, and power means on said vehicle for driving said rotatable



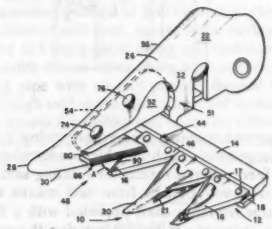
cutter means and for independently translating and pivoting said boom relative to said sub-frame.

3,952,486

RECIPROCATING MOWER SHOE ATTACHMENT

Elmer E. Bryant, Rte. No. 2, Townsend, Tenn. 37882

Filed Jan. 20, 1975, Ser. No. 542,169
Int. Cl.² A01D *55/02*
U.S. Cl. 56—303 2 Claims



1. An attachment in combination with a shoe of a reciprocating type mower having a reciprocating sickle blade including sickle knives mounted on a sickle bar, said shoe having a generally upright portion in which there is provided a slot through which the outermost end portion of the sickle blade together with the outermost sickle knife passes during its reciprocatory movement, said attachment including

a generally planar upright shield disposed in substantially parallel relationship to said shoe and covering said slot in said shoe, said shield defining vertically oriented elongated holes in said shield, means adjustably received in said holes and releasably mounting said shield on said shoe in a selectable vertical position relative to said slot in said shoe, and

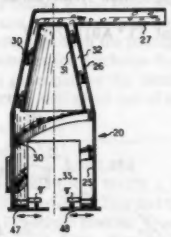
a generally rectangular planar blade mounted in substantially perpendicular relation to said shield on the lower edge of said shield and extending therefrom and through said slot in said shoe and disposed in cantilevered relationship to said outermost sickle knife at a location spaced apart from means mounting said sickle knife on said sickle bar, said blade terminating adjacent the outermost sickle knife in a cutting edge having serrations along the length thereof and coacting with said sickle knife for performing a cutting function.

3,952,487

MACHINE FOR AUTOMATICALLY GATHERING FRUITS AND IN PARTICULAR ENABLING VINTAGING

Georges Guibeaud, 58, rue Marechal Foch, 66000 Perpignan, France

Filed July 22, 1974, Ser. No. 490,859
Claims priority, application France, July 23, 1973, 73.26974
Int. Cl.² A01D *46/00*
U.S. Cl. 56—328 R 13 Claims



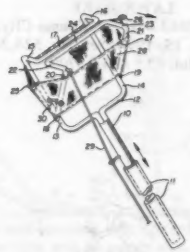
1. A machine for automatically picking fruits and berries on shrubs comprising means for enclosing the shrubs within an enclosed space which is subjected to the action of an air stream likely to sever the fruits and berries, said enclosed space comprises at least one bell which encloses in substantially fluid-tight relationship the major part of the shrub; means for blowing within the enclosed space an air flow of rising gyratory displacement, means for modulating and vibrating the gyratory rising air flow in the bell, and means for receiving within a top portion of the bell the severed fruits which have risen to the top portion by the centrifugal motion of the air flow.

3,952,488

FRUIT PICKER

Mark B. Coulter, P.O. Box 3352, St. Petersburg, Fla. 33731

Filed Jan. 7, 1975, Ser. No. 539,257
Int. Cl.² A01D *46/24*
U.S. Cl. 56—333 6 Claims



1. A fruit picker comprising a fixed jaw on a pole-like handle, a movable jaw and means pivotally securing said movable jaw to said fixed jaw, means for moving said movable jaw relative to said fixed jaw, said fixed jaw being bifurcated and having spaced parallel portions, right angular parallel extensions on said spaced parallel portions and an elongated straight portion joining said right angular extensions, said movable jaw having secondary spaced parallel portions, secondary right angular extensions on said secondary parallel portions of said movable jaw and a secondary elongated straight portion joining said secondary right angular extensions, said means pivoting said movable jaw to said fixed jaw

engaging said spaced parallel portions and secondary spaced parallel portions respectively, said straight portions arranged in normally closely spaced parallel relation to one another, a bag having an enlarged open upper end secured to said jaws in outwardly spaced relation to said straight portions.

3,952,489

HAY-MAKING MACHINES

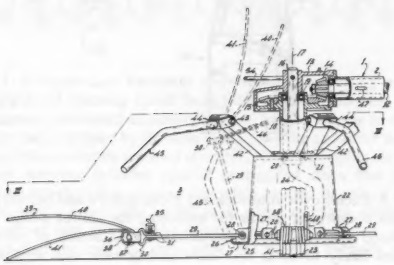
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed June 11, 1974, Ser. No. 478,227

Claims priority, application Netherlands, June 13, 1973, 7308237

Int. Cl.² A01D 79/00

U.S. Cl. 56—370 47 Claims



1. A hay making machine comprising a frame and at least one rake head rotatably mounted on said frame, said rake head comprising a first group of crop working elements and a second group of crop working elements, each of said groups having corresponding arms which are different for each group and fastening portions that pivotably connect same to a central hub-like portion, said groups each being pivotable and vertically movable relative to said hub-like portion independent of the other group and driving means connected to said head to rotate same about a non-horizontal axis, said first group of elements including raking elements which are pivotable about an axis that is substantially perpendicular to the axis of rotation of said head.

3,952,490

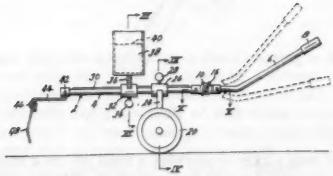
LAWN RAKE

Furn O. Brockman, 3843 61st St., Kansas City, Mo. 64130

Filed Nov. 15, 1974, Ser. No. 524,366

Int. Cl.² A01D 7/00

U.S. Cl. 56—400.14 2 Claims



1. A lawn rake comprising:

a. an elongated longitudinally extending frame consisting of a substantially horizontal front bar section and an inclined rear bar section which constitutes a handle,

b. a generally horizontal transverse rake bar at the forward end of said frame,

c. means securing said rake bar to said frame,

d. rake tines carried by said rake bar and projecting downwardly therefrom,

e. ground-engaging wheels carried rotatably by said frame intermediate its ends and operable to support said frame above the ground, whereby upward and downward movement of the handle end of said frame will respectively lower said tines to the ground and raise them above the ground,

f. a weight carried by said frame intermediate said wheels and said tines, whereby to bias said tines against the ground, said weight comprising an open-topped container mounted on said frame and adapted to contain material of any desired density and mass, and

g. means operable to permit adjustable forward and rearward movement of said container relative to said frame.

3,952,491

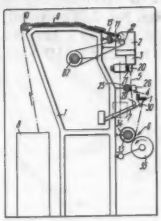
OPEN-END SPINNING FRAME

Alexandr Alexeevich Sharychenkov, Ternovka, ulitsa Experimentalnaya, 1, kv. 67, Penza, U.S.S.R.

Filed June 21, 1974, Ser. No. 481,822

Int. Cl.² D01H 1/12

U.S. Cl. 57—34 R 6 Claims



1. An open-end spinning frame comprising a plurality of spinning arrangements, each of which comprises: a combing drive roll; a feed roller; a means for rotating said feed roller; a clutch to transmit rotation from said means to said feed roller; a twister having a shaft provided with a flexible coupling running thereover to impart rotation thereto; a motion for retracting said flexible coupling from the twister shaft; a motion for delivering the yarn out of said twister installed beneath said twister; s building motion provided with a brake member; a yarn tension pickup lever disposed intermediate said building motion and said delivery motion; a motion for simultaneously disconnecting and sequentially actuating said feed roller, twister and building motion incorporating a bar displacable to two positions for disconnection and actuation, respectively, and a hollow cylinder, with said bar running through said hollow cylinder, a means for spring-urging said bar to said cylinder; a means for positively displacing said bar in a vertical plane to one of said positions to effect said disconnection; a means positively displacing said bar in a vertical plane to the other of said positions to effect said actuation; a stop mounted on the bar and adapted to cooperate with said feed roller clutch in the two positions of said bar; another stop mounted on the bar and adapted to cooperate with said motion for retracting said flexible coupling from the twister shaft; said cylinder being linked with the bar in order to be able to travel therewith to said disconnection position thereof; a stop provided on said cylinder and adapted to cooperate with the brake member of the building motion; and a means for temporarily restraining the cylinder from accompanying the bar in the travel thereof to the position of actuation of the building motion in the course of resumption of operation of the spinning arrangement.

3,952,492

METHOD AND APPARATUS FOR CONTINUOUSLY CONNECTING A DISPLACEABLE PNEUMATIC CONDUIT WITH A MAIN PNEUMATIC DUCT IN A TEXTILE MACHINE

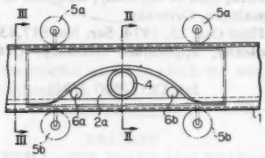
Tsutomu Miyazaki; Takashi Kato, both of Kariya; Toshio Yoshizawa, Chiryu, and Yasuo Yamada, Kariya, all of Japan, assignors to Daiwa Boseki Kabushiki Kaisha, Osaka and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of, Japan

Filed June 27, 1974, Ser. No. 483,560

Claims priority, application Japan, June 28, 1973, 48-73410; July 24, 1973, 48-83469; Nov. 22, 1973, 48-131552; Dec. 4, 1973, 48-135962

Int. Cl.² D01H *11/00*

U.S. Cl. 57—34.5 **13 Claims**



1. In a textile machine provided with displaceable means for carrying out an operation utilizing suction air and a main pneumatic duct disposed along the entire length of the machine for applying suction air pressure to said displaceable means, and a suction source for creating said suction pressure, the improvement comprising means for continuously connecting said main duct with said displaceable means, said means for continuously connecting said main duct comprising a continuous aperture formed in said main duct along the longitudinal direction of said duct, means for covering said continuous aperture to form a space along said continuous aperture; said displaceable means comprising a pneumatic pipe means, a connecting pipe with an end portion thereof inserted into said duct through said space and connected to said pneumatic pipe means, means for sealing said space on either side of said connecting pipe when said connecting pipe is displaced along said aperture according to displacement of said displaceable means.

3,952,493

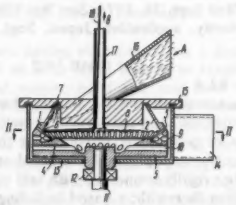
APPARATUS FOR RINGLESS SPINNING OF FIBERS

Igor Stepanovich Khomyakov, ulitsa Sovetskaya, 125, kv. 23, and Albert Arturovich Leinek, ulitsa Sovetskaya, 111, kv. 39, both of Kostroma, U.S.S.R.

Filed Feb. 20, 1974, Ser. No. 444,113

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **5 Claims**



1. An apparatus for ringless spinning of fibres comprising, in combination, a rotatably mounted spinning bowl having a side wall, said bowl side wall being provided with an inwardly inclined, inner surface of frusto-conical shape, a circumferentially extending row of downwardly inclined pins mounted in their upper ends on said side wall inner surface with a lower portion of said inner surface extending below said row of pins to define with said inner surface a circumferentially extending trough, said pins being arranged in a uniform, spaced-apart relationship to permit the passage therethrough of unspinnable fibres and dust only, said side wall being provided with a plurality of circumferentially spaced, radially extending apertures having inner ends opening into said inner surface wall portion below said row of pins, means for introducing fibres into said bowl, means for rotating said bowl to draw fibres through said introducing means into said bowl and to deposit said fibres in said trough in the form of a sliver whereby unspinnable fibres and dust are moved downwardly along said inclined inner surface through the passages between said pins and into said apertures for discharge from said bowl by the centrifugal forces generated by the rotation of said bowl and means for conducting said sliver out of said bowl in the form of spun yarn.

3,952,494

OPEN-END SPINNING UNIT WITH A SPINNING ROTOR

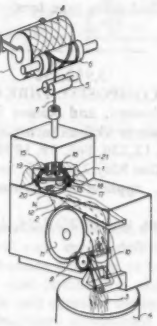
Jan Junek; Josef Ripka, both of Usti nad Orlici; Vaclav Voborník, Letohrad; Frantisek Hortlik; Frantisek Jaros, both of Usti nad Orlici; Jiri Elias, Brandys nad Orlici; Vaclav Brynda; Karel Mares, both of Usti nad Orlici; Zdenek Kotrba; Ludmila Lihtarova, both of Usti nad Orlici; Marie Brozkova, and Bozena Rehackova, both of Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Oct. 22, 1974, Ser. No. 516,885

Claims priority, application Czechoslovakia, Oct. 24, 1973, 7303-73

Int. Cl.² D01H *1/12*

U.S. Cl. 57—58.89 **16 Claims**



1. An open-end spinning unit comprising a spinning rotor having a lower side and an upper side, a lid inserted into a front opening provided in said lower side, said lid being bored so as to form a fiber supply duct to convey separated fibers into the interior of said spinning rotor; a yarn take-off duct extending through said upper side of the spinning rotor and adapted to convey the yarn via an outlet port out of the interior of the spinning rotor; a separator secured to said lid and designed to divide the rotor interior into a fiber zone and a yarn producing and take-off zone, the front surface of said separator, which faces said yarn take-off duct, constituting a directing wall for directing the yarn end being returned to be spun-in, the circumferential edge of said directing wall being located in a space defined by a pair of planes perpendicular to

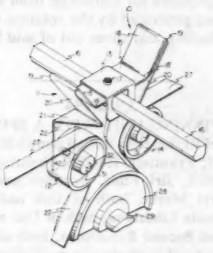
the spinning rotor axis, one of said planes passing through the maximum yarn producing and take-off zone diameter and the other being spaced 6 mm therefrom in the direction toward the yarn take-off duct.

3,952,495

TENSION PULLEY ASSEMBLY FOR TEXTILE SPINNING MACHINES

Robert H. Petty, Sanford, N.C., assignor to Roberts Company, Sanford, N.C.

Filed Feb. 20, 1974, Ser. No. 443,972
Int. Cl.² D01H *1/20*
U.S. Cl. 57—105 **7 Claims**



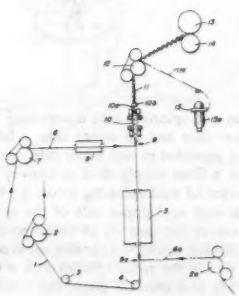
1. A drive tape tension pulley assembly of the type used on textile spinning frames comprising: means for attaching said assembly to a support bar means of said frame; and a resiliently flexible unitary tensioning and support means extending from said attaching means and operatively mounting at least one pulley means, the main tensioning effect of the assembly being a J-shaped portion of said unitary tension support means which is inherently limited in movement in one direction but is tensionly moveable in the opposite direction whereby both mounting support and drive tape tension is imparted to said pulley.

3,952,496

COMPOSITE THREAD

Manfred Nagel, Wawern, and Rainer Seuss, Konz, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Division of Ser. No. 12,220, Feb. 19, 1970, Pat. No. 3,763,640.
This application May 21, 1973, Ser. No. 362,183
Claims priority, application Germany, Feb. 19, 1969, 1908219
Int. Cl.² D02G *3/34, 1/02*
U.S. Cl. 57—144 **14 Claims**



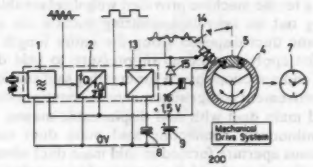
1. A composite thread comprising at least one false-twisted multifilament core thread and a sheath consisting of at least one additional multifilament thread wrapped around the core thread with at least a partial separation and spreading out of the sheath thread into its individual filaments longitudinally of the core thread in an irregular and fluctuating enveloping pattern of the individual filaments along the core thread, said sheath exhibiting along random portions of the core thread an enlarged nodule characterized by a reverse overlapping application of an individual filament or group of filaments wrapped forwardly and backwardly over the nodule longitudinally of the core thread.

3,952,497

METHOD AND APPARATUS FOR SYNCHRONIZING ANDOSCILLATING SYSTEM WHICH IS DRIVEN BY AN ENERGY STORAGE DEVICE

Hansrichard Schulz, VS-Villingen, and Herbert Hummel, Niedereschach, both of Germany, assignors to Heinz Jauch, VS-Schwenningen, Germany

Filed Oct. 23, 1974, Ser. No. 517,430
Claims priority, application Germany, Oct. 24, 1973, 2353200
Int. Cl.² G04C *3/04*
U.S. Cl. 58—28 R **30 Claims**



1. A timing apparatus comprising an oscillating system driven by a mechanical energy storage means, a quartz timing oscillator, a frequency divider coupled to said oscillator for forming timing pulses, a synchronization means acted on by said pulses and controlling said system and deriving movement pulses from said system, a phase comparison stage connected to the divider and to the synchronization means, said synchronization means being subjected to a synchronizing action corresponding to the relative phase position between the timing pulses and the movement pulses.

3,952,498

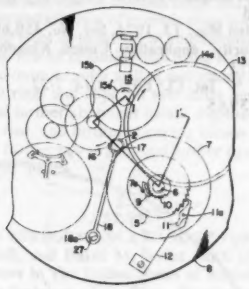
AUTOMATIC BARREL WINDING MECHANISM

Mituo Saito, and Kotaro Takahashi, both of Tokyo, Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Sept. 26, 1974, Ser. No. 509,401
Claims priority, application Japan, Sept. 28, 1973, 48-108972
Int. Cl.² G04B *5/02*
U.S. Cl. 58—82 A **3 Claims**

1. In an automatic barrel winding mechanism of a watch movement, comprising: a rigid frame; a member preferably a barrel bridge or pillar plate provided for the rigid frame; a winding eccentric mass pivotably mounted on said member; a pinion member rigidly connected with said eccentric mass for unitary rotation therewith; a barrel including a power spring; and a reduction gear train including a winding gear wheel which cooperates with said barrel, and a second gear means in mesh with the winding gear wheel and the pinion member, the improvement that means allowing the second gear means to rotate exclusively only in the barrel winding direction is provided, said means including a pawl mounted on said mem-

ber, a ratchet wheel integral with the second gear means, and a spring mounted on said member for resiliently urging the



pawl towards the ratchet wheel in which the winding torque ratio of said mechanism is 0.5 – 1.1.

3,952,499

WATCH CASES, DIALS AND BEZELS

Emeric Reisman, 4705 16th Ave., Brooklyn, N.Y. 11204

Filed Mar. 4, 1975, Ser. No. 555,235

Int. Cl.² G04B *19/24, 37/06*

U.S. Cl. 58—88 R **2 Claims**

1. A one piece construction forming the entire top cover for a timepiece movement except at the center thereof comprising the dial for the timepiece and the entire case therefor except at the bottom surface of the movement, said case having a groove thereon for receipt of a crystal.

3,952,500

ORNAMENTAL CLOCK

Hiroshi Tomura, Tokyo, Japan, assignor to Aoki Ltd., Japan

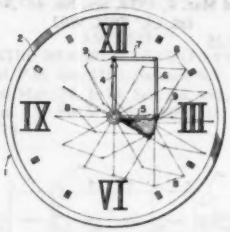
Filed Dec. 30, 1974, Ser. No. 537,425

Claims priority, application Japan, Jan. 23, 1974, 49-9663[U]

Int. Cl.² G04B *19/04, 45/00*

U.S. Cl. 58—126 D **4 Claims**

1. In a timepiece having time indicia on a face thereof, a minute hand and an hour hand shorter in length than said minute hand, said minute hand and said hour hand being driven rotationally about a common axis of rotation for indicating time in conjunction with said time indicia, said minute hand and said hour hand each having an end portion remote from said axis of rotation, a first link of a length substantially equal in length to the minute hand and having a first end portion pivotally connected to said end portion of said hour hand remote from said axis of rotation for rotation therewith, a second link of a length substantially equal in length to the hour hand and having a first end portion pivotally connected to said end portion of said minute hand remote from said axis of rotation for rotation therewith, said first link and said second link having second end portions, and means pivotally connecting said second end portions of said first link and said second link remote from said axis of rotation, whereby as the



minute hand, the hour hand, the first link, and said second link are rotationally driven parallelograms of varying configuration are defined thereby.

3,952,501

GAS TURBINE CONTROL

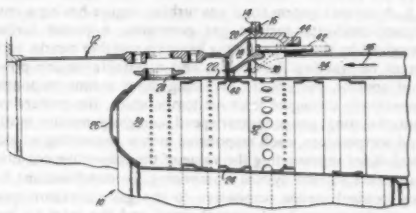
John A. Saintsbury, St. Bruno, Canada, assignor to United Aircraft of Canada Limited, Longueuil, Canada

Continuation-in-part of Ser. No. 244,134, April 14, 1972, abandoned. This application Jan. 2, 1974, Ser. No. 429,946

Claims priority, application United Kingdom, Apr. 15, 1971, 9530/71

Int. Cl.² F02C *9/14*

U.S. Cl. 60—39.23 **11 Claims**

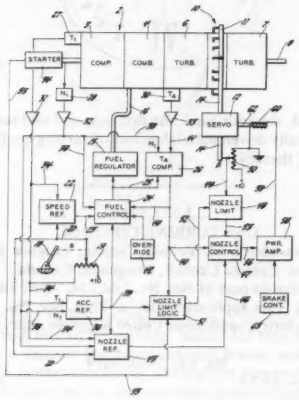


1. In a continuous combustion device, a combustion chamber having a peripheral wall, means defining an air passage surrounding said combustion chamber, at least a fuel injector for feeding fuel into said combustion chamber, a primary combustion zone within said chamber defined around said fuel injector, at least a secondary combustion zone within said chamber defined adjacent said primary zone and downstream thereof, first air inlets in said peripheral wall in the area of said primary zone communicating with said air passage, second air inlets in said peripheral wall in the area of said secondary zone communicating with said air passage, a baffle provided in said air passage between the air inlets for said primary zone and the air inlets for said secondary zone, means for moving said baffle between a first position and a second position whereby in said first position air passes relatively unimpeded to both the primary zone and the secondary zone, and at the second position the baffle impedes the flow of air to said primary zone by deflecting a larger proportion of the air to the secondary combustion zone thereby modifying the characteristics and flow path of the primary zone and said secondary zone providing a richer fuel/air mixture in the primary zone to thereby reduce the relative carbon monoxide and hydrocarbon emissions from said combustion chamber.

3,952,502
GAS TURBINE CONTROL

James L. Davis; Edward L. Lopke, both of Kokomo, and Leslie Joseph Pechous, Carmel, all of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 4, 1974, Ser. No. 447,846
Int. Cl.² F02C 9/02
U.S. Cl. 60—39.25 7 Claims

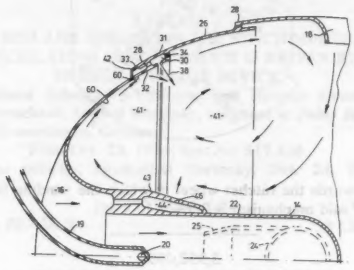


1. A control system for a gas turbine engine having a compressor-combustor-turbine gas generator, a power turbine energized by the gas generator having a variable nozzle, servo means for varying the nozzle, and a settable engine power level control, the system including input means responsive respectively to engine inlet air temperature, the power level control setting, gas generator speed, and gas generator motive fluid temperature, each responsive means generating an electrical signal representing the value of the respective condition responded to: the system comprising, in combination, fuel loop control means responsive to the gas generator speed signal, the power level control signal and the inlet air level signal to maintain gas generator speed at a constant idle speed through a predetermined low end of the power level signal range, means responsive to the inlet air temperature signal for generating an acceleration reference temperature signal increasing with inlet air temperature only up to a predetermined value of inlet air temperature; a nozzle reference temperature signal generating means responsive to the acceleration ration reference temperature signal and to the gas generator speed signal effective to generate a nozzle reference temperature signal increasing with gas generator speed and with the acceleration reference temperature signal; and signal generating means responsive to the inlet air temperature signal and the power level control signal coupled to the nozzle reference temperature circuit so as to reduce the nozzle reference temperature signal at idle gas generator speed as a function of the inlet air temperature and power level signals at the predetermined low end of the power level signal range below a predetermined ratio of power level signal to inlet air temperature signal; so that the nozzle reference temperature signal increases at constant gas generator idle speed over the said low end as maintained by said fuel loop control means and then increases with gas generator speed up to maximum rated speed; the servo means being responsive to the nozzle reference temperature signal and the motive fluid temperature signal for varying the power turbine nozzle.

3,952,503
GAS TURBINE ENGINE COMBUSTION EQUIPMENT

Roger Geoffrey Fox, and Vernon Frederick Cox, both of Bristol, England, assignors to Rolls-Royce (1971) Limited, Bristol, England

Filed Mar. 13, 1974, Ser. No. 450,689
Claims priority, application United Kingdom, Mar. 20, 1973, 13274/73
Int. Cl.² F02C 3/14, 7/22
U.S. Cl. 60—39.65 6 Claims

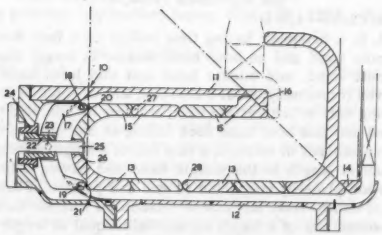


1. A gas turbine engine combustion chamber comprising a flame tube having an annular wall, an upstream end wall and a fuel vaporizer extending into said flame tube from the end wall; a hollow stem for said vaporizer extending in a generally downstream direction from the end wall and to which, in operation, air and fuel are delivered separately; at least one radial branch connected to the hollow stem through which there passes a mixture of said fuel and air from the hollow stem, said radial branch terminating in a generally upstream facing opening for delivery of said mixture into the flame tube; radially inner and radially outer wall portions for said annular wall; means defined by said inner and outer wall portions for allowing air to pass into the flame tube and means provided by said inner wall portion defining a substantially continuous inwardly facing slot extending around the annular wall of the flame tube and communicating with the interior of the flame tube for the passage of air therethrough into the interior of the flame tube in a continuous inwardly directed curtain normal to the inner wall portion.

3,952,504
FLAME TUBES

Gordon Sedgwick, Lancashire, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Dec. 14, 1973, Ser. No. 424,736
Int. Cl.² F02G 1/00
U.S. Cl. 60—39.69 10 Claims



1. A flame tube comprising a casing having an outer annular wall and an inner annular wall, a plurality of monolithic ceramic rings within the casing in a side-by-side row, abutment

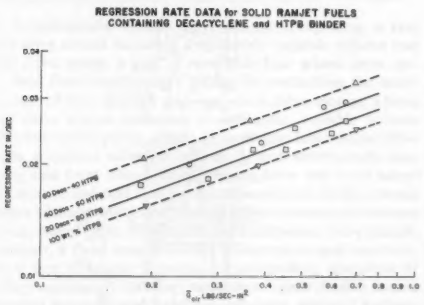
means at one end of said row of ceramic rings, clamping means at the opposite end of said row urging said row against said abutment means, engaging surfaces between said abutment means and said row of ceramic rings and between said clamping means and said row of ceramic rings lying on straight lines emanating from a point on a longitudinal axis of the flame tube, said row of ceramic rings being mounted radially inwardly of said outer annular wall of said casing and a further row of ceramic rings and adjacent said inner annular wall of said casing, and further abutment means disposed at one end of said further row, and further clamping means at the opposite end of said further row urging said further row against said further abutment means.

3,952,505

HIGH PERFORMANCE RAMJET FUELS

Bertram O. Stull, and David M. Bullat, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1974, Ser. No. 493,444
Int. Cl.² F23R *1/14*
U.S. Cl. 60—219 **3 Claims**



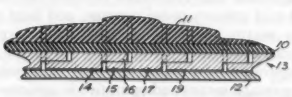
1. In a method for propelling a ramjet engine wherein a solid fuel is combusted in the presence of air within a combustion chamber and gases produced by the combustion process are exited through a nozzle to propel the engine, the improvement residing in utilizing as said solid fuel a composition comprising a combination of hydroxy terminated polybutadiene and a member selected from the group of high density additives consisting of anthracene and decacyclene.

3,952,506

ROCKET MOTOR CONSTRUCTION

Albert W. Macbeth, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed Nov. 7, 1973, Ser. No. 413,477
Int. Cl.² F02K *9/04*
U.S. Cl. 60—255 **7 Claims**



1. In a rocket motor that includes a case and a solid propellant grain therein, the improvement comprising:

an elastomeric sheath surrounding and bonded to the propellant grain on surfaces thereof that are adjacent the case; and

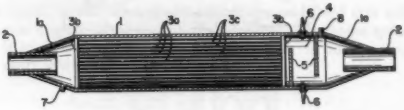
a bearing sleeve of noncombustible material bonded to the elastomeric sheath, and unbonded to the case, the bearing sleeve comprising a series of overlapping segments, whereby longitudinal expansion and contraction of the propellant grain relative to the case are permitted without harmful stress.

3,952,507

CANISTER REBURN EXHAUST SYSTEMS

Henry Bonarski, P.O. Box 1191, Savona, N.Y. 14879

Filed Mar. 29, 1974, Ser. No. 456,262
Int. Cl.² F02M *25/06*; F01N *3/14*
U.S. Cl. 60—278 **5 Claims**



1. An axial flow reburn canister system for an internal combustion engine having an electrical ignition system and a carburetor and having an exhaust pipe leading to a muffler, comprising a cylindrical casing of greater diameter than the exhaust pipe and having axially disposed inlet and outlet end portions shaped to couple into the exhaust pipe in advance of the muffler; at least one canister tube unit tranversely filling said casing and approaching its ends, said unit comprising a pair of spaced end plates peripherally welded to the casing and having perforations extending therethrough receiving the ends of canister tubes which are welded therein, whereby the exhaust gases must pass through the canister tubes on their way to the muffler; the casing having an axial space located downstream of one of the end plates to provide an exhaust reburn chamber; axially-spaced transversely disposed baffle plates within the chamber spaced downstream of said one end plate, each baffle plate covering substantially three-fourths of the cross-sectional chamber area and being shaped to provide a zig-zag path through the chamber; at least one spark plug in said chamber disposed between the baffle plates and connected in the ignition system; means for admitting air into the casing at the inlet end portion of the casing; and means for returning burnt gases from the downstream end of the chamber to the carburetor.

3,952,508

CONTROL FOR FLUID COUPLING

Warren G. Bopp, Farmington, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 31, 1975, Ser. No. 563,551
Int. Cl.² F16D *33/00*
U.S. Cl. 60—330 **45 Claims**

1. A fluid coupling comprising:

a first rotatable member defining a housing rotatable about an axis;

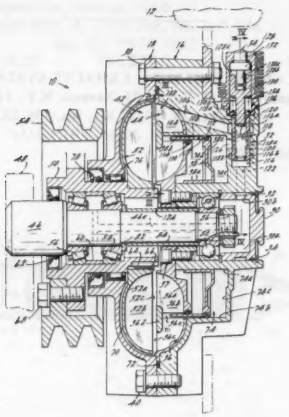
a second member disposed in the interior of said housing and rotatable about said axis;

a working chamber defined by said members and containing an inventory of fluid for transmitting torque from one of said members to the other of said members via said fluid in response to relative rotation between said members;

control means including means moveable between first and second positions for varying the torque transmitted by said fluid; and

temperature sensing means radially disposed with respect to said axis and mounted on the exterior of said housing and

including means operative to urge said moveable means between said first and second positions in response to



changes in temperature ambient to the exterior of said housing.

3,952,509

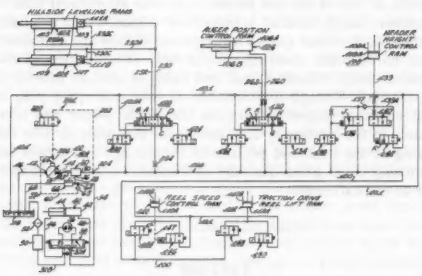
HYDRAULIC SYSTEM COMBINING OPEN CENTER AND CLOSED CENTER HYDRAULIC CIRCUITS

Martin W. Coleman, Independence, Mo., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Apr. 10, 1975, Ser. No. 566,965

Int. Cl.² F15B *11/16*; F16H *39/46*

U.S. Cl. 60—422 **16 Claims**



1. In a hydraulic system, the combination comprising a variable displacement pump, said pump including a hydraulically actuated stroke control means which may be actuated to vary the displacement of said pump, said pump including an inlet through which hydraulic fluid is admitted to said pump, said pump including an outlet through which hydraulic fluid is discharged from said pump, a flow divider having an inlet connected to said outlet of said pump, said flow divider having first and second outlets, said flow divider being operable to divide the pump flow to said first and said second outlets, with said first outlet receiving a priority constant magnitude flow, an open center hydraulic circuit connected to said first outlet whereby to receive said priority constant magnitude flow, a closed center hydraulic circuit connected to said second outlet, a first pilot circuit responsive to the pressure condition in said open center hydraulic circuit and operatively connected to said hydraulically actuated stroke control means whereby to vary the condition of said hydraulically actuated stroke control means as a function of the pressure condition in said open center hydraulic circuit, and a second pilot circuit operatively connectable to said hydraulically actuated stroke control means, whereby to vary the condition of said hydraulically actuated stroke control means, and means effective to operatively connect said second pilot circuit to said hydraulically actuated stroke control means only when there is a demand for hydraulic fluid flow from said second outlet to said closed center hydraulic circuit.

3,952,510

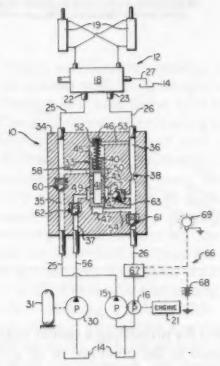
FLOW SENSING AND CONTROL APPARATUS

Wayne A. Peterson, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 6, 1975, Ser. No. 584,426

Int. Cl.² F15B *13/09*

U.S. Cl. 60—403 **26 Claims**



J. Flow sensing and control apparatus, for use in combination with a hydraulic system including a pair of primary pumps and a control valve having a separate inlet for each of such pumps, to selectively combine the output of an auxiliary pump with such hydraulic system, comprising;

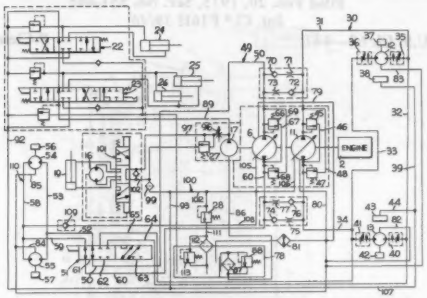
a valve body having a primary pump passage through which fluid from one of said primary pumps is conducted to its respective inlet of the control valve, auxiliary pump passage means interconnected between the auxiliary pump and said primary pump passage, and fluid receiving passage means connected to said auxiliary pump passage means; and

pilot operated valve means disposed within said fluid receiving passage means and operative in response to fluid flow through said primary pump passage to selectively control the admission of fluid to the fluid receiving passage means so as to permit the combining of any available fluid from the auxiliary pump with that of the primary pump up to a predetermined minimum flow rate through the primary pump passage and to permit diversion to the receiving passage means of any excess fluid of the auxiliary pump above that necessary to maintain said minimum flow rate in the primary pump passage.

3,952,511
HYDROSTATIC DRIVE CIRCUIT

Robert M. Turner, Great Bend, and Herbert Z. Langland, Topeka, both of Kans., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 30, 1974, Ser. No. 537,609
Int. Cl.² F15B 18/00
U.S. Cl. 60—430 10 Claims



1. A hydrostatic vehicle drive system comprising, a rear wheel drive circuit including a reversible variable volume rear wheel drive pump, a pair of reversible rear wheel drive motors, fluid flow control valve means for controlling the maximum rate of flow through said rear wheel drive motors, a front wheel drive circuit including a reversible, variable volume front wheel drive pump, a pair of reversible front wheel drive motors, a control valve for selectively and alternatively connecting said front wheel drive pump to drive said front wheel drive motors and said rear wheel drive motors, bi-directional pressure compensating flow control valves connected between said rear wheel drive circuit and said front wheel drive circuit, a reservoir, a fixed volume pump connected to said reservoir, at least one hydraulic actuator for controlling operation of auxiliary equipment, auxiliary equipment control valve means connected between said fixed volume pump and said hydraulic actuators, a hydraulic actuator for operating a steering mechanism, a priority flow control divider for supplying hydraulic fluid to said steering hydraulic actuator, a pump charging circuit connected to said priority flow control divider including a pressure relief valve for connecting said charging circuit to said reservoir for maintaining a predetermined pressure in said charging circuit, means connecting said fluid charging circuit to the inlet of said variable volume pumps, to thereby assure satisfactory charging of fluid to said variable volume drive pumps and said drive wheel motors.

3,952,512
FOOT PEDAL CONTROL MECHANISM FOR HYDROSTATIC TRANSMISSION VEHICLES

Murray D. Feller, Richmond, Canada, assignor to Towmotor Corporation, Mentor, Ohio

Filed Jan. 30, 1975, Ser. No. 545,643
Int. Cl.² F16H 39/46; F15B 15/18
U.S. Cl. 60—431 8 Claims

1. Control mechanism enabling selection of vehicle speed and drive direction in a vehicle having a motor speed control element movable from an idling position to increase motor speed and also having a hydrostatic transmission control element movable in one direction from a neutral position to progressively increase forward drive ratio and movable in an opposite direction from said neutral position to progressively increase reverse drive ratio, said control mechanism comprising:

an operator's control member supported for forward and backward rocking movement from a neutral position,

a first shaft supported for rotational motion about the axis thereof and being coupled to said operator's control member to be turned in a first rotational sense upon forward rocking of said control member and to be turned in an opposite rotational sense upon backward rocking of said control member,

a first arm extending radially from said first shaft for turning therewith,

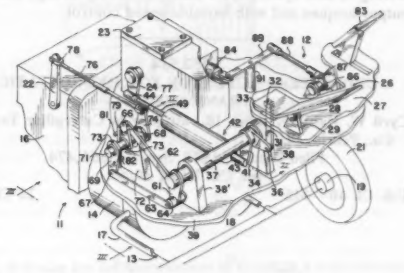
a first link means for connecting said first arm and said transmission control element whereby said transmission control element is moved in said one direction in response to forward rocking of said control member and is moved in said opposite direction in response to said backward rocking of said control member,

a second arm extending radially from said first shaft for turning therewith,

a secons shaft supported for rotational movement about the axis thereof,

a third arm extending radially from said second shaft for turning therewith,

an engine speed control rod connecting said third arm with said engine speed control element whereby engine speed is increased upon rotational movement of said second shaft in a specific direction,



first and second spaced apart levers mounted upon said second shaft and extending radially therefrom in substantially opposite directions when said control member is at said neutral position, said first and second levers being turnable relative to said second shaft,

second and third link means for connecting said first and second levers respectively to said second arm whereby said first and second levers are turned in opposite rotational directions in response to movement of said second arm,

rod means extending radially from opposite sides of said second shaft and being secured thereto for turning motion therewith,

means on said first lever for contacting said rod means to turn said rod means and said second shaft in said specific direction when said first shaft is turned in said first rotational sense, and

means on said second lever for contacting the other end of said rod means to turn said rod means and said second shaft in said specific direction when said first shaft is turned in said opposite rotational sense.

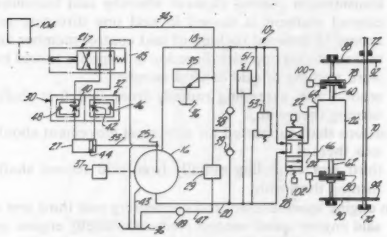
3,952,513
VARIABLE SPEED AND TORQUE FEED SYSTEM

Philip A. Kubik, 251 Minnesota, Troy, Mich. 48084

Filed Jan. 6, 1975, Ser. No. 538,808
Int. Cl.² F16H 39/46; F15B 11/02
U.S. Cl. 60—435 5 Claims

1. A rapid traverse and feed device comprising a fluid motor having two output shafts and a common fluid pressure responsive means operable upon communication with fluid pressure to translate said fluid pressure to one of said shafts in the form of a high torque output while rotating said one shaft at a low speed, said fluid pressure responsive means being operable to translate fluid pressure to the other of said shafts in the form of a low torque output while rotating said other shaft at a high

speed; means for communicating fluid pressure to said fluid pressure responsive means; a system drive shaft; and means for alternate, independent coupling of said two output shafts



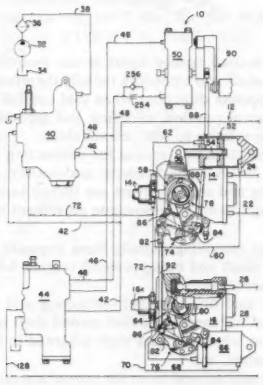
to said drive shaft to permit the selective and independent driving of said system drive shaft selectively at high and low output torques and with variable speed control.

3,952,514

UNDERSPEED ACTUATOR FOR HYDROSTATIC TRANSMISSION

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 20, 1975, Ser. No. 551,474
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **22 Claims**



1. A control system for regulating displacement of a pump unit in a hydrostatic transmission including input means and output means, the control system having a positive displacement pump means driven in conjunction with the transmission input means to produce output fluid flow proportional to the operating speed of the transmission input means, and comprising

lever means coupled with the pump unit for selectively adjusting its displacement,

a hydraulically responsive underspeed actuator operatively coupled with the lever means in order to adjust its effective moment arm and thereby vary the amount of actual change in pump displacement relative to movement of the lever means, and

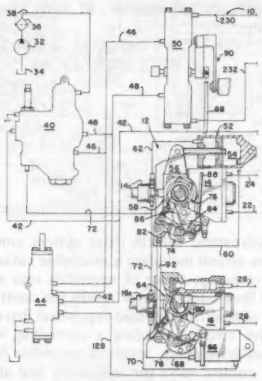
signal means for receiving output fluid flow from the positive displacement pump means and communicating a variable fluid signal to which the underspeed actuator is responsive.

3,952,515

SPEED AND LOAD RESPONSIVE UNDERSPEED ACTUATOR FOR HYDROSTATIC TRANSMISSIONS

Cyril W. Habiger; William D. McMillan, both of Joliet; David L. Persson, Chillicothe, all of Ill., and Glenn E. Ferre, deceased, late of Peoria, Ill. (by Marjorie E. Ferre, legal representative and executrix), assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 20, 1975, Ser. No. 551,465
Int. Cl.² F16H *39/46*
U.S. Cl. 60—447 **9 Claims**



1. A control system for regulating displacement of a pump unit in a hydrostatic transmission for communicating output fluid under pressure to a motor unit, the control system having a proportional pump means driven in conjunction with the transmission input means to produce output fluid flow proportional to the operating speed of a transmission input means, and comprising

control means coupled with the pump unit for selectively adjusting its displacement,

a hydraulically responsive underspeed actuator operatively coupled with the control means in order to adjust the amount of actual change in pump displacement relative to movement of the control means,

signal means for receiving output fluid flow from the proportional pump means and communicating a variable fluid signal to which the underspeed actuator is responsive, and

means for sensing changes in output fluid pressure of the pump unit and biasing the underspeed actuator in response to such pressure changes in order to further stabilize the displacement setting of the pump unit, its output fluid pressure and operating speed of the transmission input means.

3,952,516

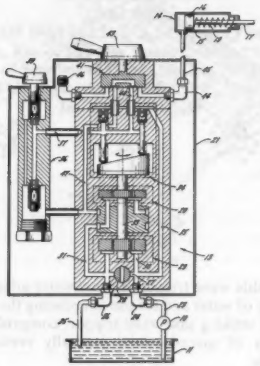
HYDRAULIC PRESSURE AMPLIFIER

Ellsworth W. Lapp, Lapp Engineering, c/o Kinroth & Son Mfg. Co., 3423 Lonergan Drive, Rockford, Ill. 61105

Filed May 7, 1975, Ser. No. 575,187
Int. Cl.² F15B *15/18*
U.S. Cl. 60—477 **3 Claims**

1. A hydraulic amplifier operable to receive low pressure fluid from a low pressure pump, to increase the pressure of said fluid, and to deliver the high pressure fluid to a utilization device, said amplifier being selectively operable to conduct fluid from said utilization device to a reservoir associated with said pump, said amplifier comprising, in combination, a hydraulic motor connected to receive and be actuated by part of the low pressure fluid delivered from said pump, a high pressure pump connected to receive part of the low pressure fluid

delivered from said low pressure pump and operable when driven to increase the pressure of such fluid, means connecting said high pressure pump with said motor and operable to drive said high pressure pump when said motor is actuated, a scavenging pump connected to be driven by said motor and having an outlet adapted to communicate with said reservoir, and valve means selectively movable between a first position



connecting the outlet of said high pressure pump with said utilization device and a second position connecting the inlet of said scavenging pump with said utilization device whereby high pressure fluid is delivered to said utilization device by said high pressure pump when said valve means are in said first position and is pumped from said utilization device and delivered to said reservoir by said scavenging pump when said valve means are in said second position.

3,952,517

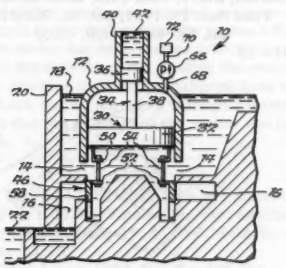
BUOYANT RAM MOTOR AND PUMPING SYSTEM

Bert J. Decker, 136 Capen Blvd., Buffalo, N.Y. 14226

Filed Oct. 3, 1973, Ser. No. 403,111

Int. Cl.² F03B *13/12*

U.S. Cl. 60—502 **1 Claim**



1. A buoyant ram motor comprising:
a. a housing capable of retaining liquid;
b. a buoyant ram positioned within said housing for reciprocal movement in a generally vertical direction;
c. controlled passage means for admitting liquid from a source into said housing beneath said buoyant ram and for removing liquid from said housing beneath said ram;
d. means for providing a vacuum in the region of said housing over said ram; and
e. means for coupling said ram to a mechanical load;
f. whereby during each cycle of operation of said motor liquid first is admitted to said housing below the buoyant ram, thereby forcing said ram in an upward direction and then liquid is removed from said housing below said ram, thereby returning said ram in a downward direction.

3,952,518

DEVICE FOR THE TRANSMISSION OF FORCES IN BRAKE BOOSTERS

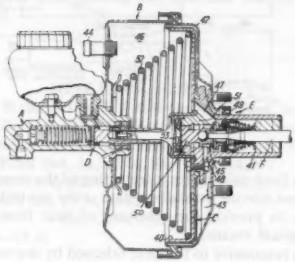
Franz Pech, Neu-Isenburg; Armin Lauterwasser, and Horst Quitmann, both of Frankfurt am Main, all of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed June 22, 1972, Ser. No. 265,135

Claims priority, application Germany, July 20, 1971, 2136252

Int. Cl.² F15B *9/10*

U.S. Cl. 60—553 **35 Claims**



1. A device for the transmission of forces in a brake booster comprising:
a brake booster housing having a longitudinal axis;
a control means disposed coaxially of said axis;
a servo motor disposed coaxially of said axis and in a cooperative relation with said control means;
a hydraulic system actuation device disposed coaxially of said axis; and
a plurality of two-arm radially disposed levers disposed coaxially of said axis and in a cooperative contacting relationship with said control means, said servo motor and said actution device to sum up the control force of said control means and the boosting force of said servo motor and to transmit the resultant sum of said forces to said actuation device during an entire braking operation each arm of said plurality of two-arm levers being interconnected by an elastic connection at a point radially spaced from the outer edges of said arms to form a preassembled single structural element.

3,952,519

HEAT TRANSFER SYSTEM EMPLOYING SUPERCOOLED FLUIDS

William K. R. Watson, San Diego, Calif., assignor to Kay Laboratories, Inc., San Diego, Calif.

Filed July 2, 1973, Ser. No. 375,512

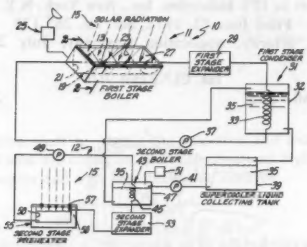
Int. Cl.² F03G *7/02*

U.S. Cl. 60—641 **20 Claims**

1. In combination for providing a controlled transfer of heat from a first chemical:
means for providing for a heating of the first chemical;
a container;
conducting means providing for a flow of the first chemical in the heated state through the container;
second chemical means disposed in the container separated from the conducting means but in heat-conducting relationship to the first chemical for absorbing heat from the first chemical in the heated state, the second chemical

means being normally disposed in a solid crystalline state and being provided with characteristics for being converted from the solid crystalline state to a liquid state at a controlled temperature and for being retained in the liquid state at temperatures below the controlled temperature;

the second chemical means having characteristics for storing the absorbed heat energy without any heat loss of such heat energy until triggered at a predetermined time at the controlled temperature and for releasing the absorbed heat at the controlled temperature upon such triggering;



means for providing for a triggering of the second chemical means into the crystalline state at the controlled temperature to provide for a release of heat from the second chemical means;

means responsive to the heat released by the second chemical means for using such released heat to provide work energy; and means for providing for the heating of the second chemical means by the first chemical flowing through the container to convert the second chemical means from the crystalline state to the liquid state at the controlled temperature.

3,952,520

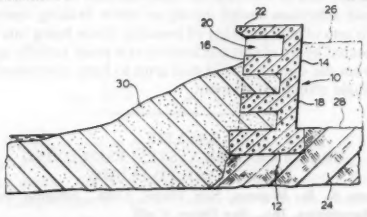
SHORELINE RETAINING WALL

Thomas H. Shillingford, 26 Underhill Drive, Suite 709, Don Mills, Ontario, Canada

Continuation-in-part of Ser. No. 453,693, March 22, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,261

Int. Cl.² E02B *3/04*

U.S. Cl. 61—4 **8 Claims**



1. A retaining wall for use in stabilizing shoreline erosion, comprising a footing and an upright wall portion, the front face of the wall portion having a plurality of recesses spaced apart one from another to form a pattern extending substantially the length and the height of the wall, each recess being horizontally oriented and being uniform in cross-section throughout the depth thereof, the lateral dimension of the recess being not less than 18 inches in any direction, the depth of each recess being not greater than the width thereof, and not greater than 2 feet, the wall being located along the shoreline at a distance from the waterline reached by an average wave.

3,952,521

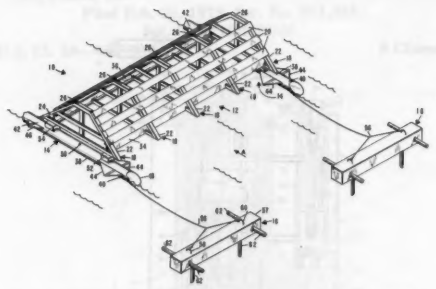
PORTABLE FLOATING WAVE TRIPPER

John M. Potter, 1828 S. Woodhouse Road, Virginia Beach, Va. 23454

Filed Oct. 29, 1974, Ser. No. 518,541

Int. Cl.² E02B *3/06*

U.S. Cl. 61—5 **5 Claims**



1. A portable wave tripper or breakwater adapted for floating in a body of water and for use in reducing the size of waves in the water striking said wave tripper, comprising:

a plurality of spaced apart, generally vertical A-shaped supports;

a plurality of elongated spaced breaker bars secured to and extending generally horizontally between said supports to form a breaker panel;

at least two hollow, elongated, spaced pontoons attached to said breaker panel generally perpendicular to the waves for floatably supporting said breaker panel in the water, each said pontoon having a forwardly projecting angled front face, each said pontoon further having a plug so that ballast may be added to or removed from said pontoons whereby the buoyancy of each said pontoon may be adjusted whereby said front face of each said pontoon is positioned at least partly beneath the surface of the water so that the waves striking said wave tripper are caused to flow over said pontoons thereby causing said wave tripper to cut through the waves; and

means securing said wave tripper at a desired location in the water.

3,952,522

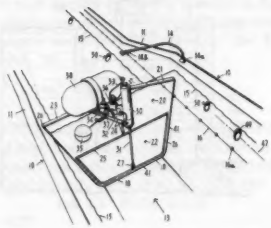
IRRIGATION SYSTEMS AUTOMATION

Ralph E. Shettel, Rte. 1, Twin Falls, Idaho 83301

Filed Nov. 19, 1971, Ser. No. 200,410

Int. Cl.² E02B *7/20, 13/00*

U.S. Cl. 61—29 **25 Claims**



1. A check structure elevating channeled waters for automatic diversion comprising:

a dam means upper stationary portion interconnecting the walls of a channel liner means above passing waters, a portion of the top surface thereof disposed as a base for actuator component mounting clear of checked water through elevation provided by a lower spillway means

adjacent thereto, the surface of said dam having extension in a lower planar framework means,

a panel means lower opening portion depending from said dam for support and acting against said framework for a closing,

control means interconnecting said lower panel and said mounting base providing selective position in regulating a diversion of water and in controlling the release of accumulated water.

3,952,523

METHOD OF INSTALLING A SCREW-TYPE ANCHOR

Jack D. Gale, Rte. 1, Crowley Road, Crowley, Tex. 76036

Division of Ser. No. 435,224, Jan. 21, 1974, Pat. No. 3,896,890. This application July 28, 1975, Ser. No. 599,764

Int. Cl.² E02D *5/80*

U.S. Cl. 61—39 **4 Claims**

1. The method of securely placing a screw-type anchor in the earth without unduly disturbing the surrounding soil, said anchor having a shank and a flight of given pitch, comprising the steps of:

a. enveloping the anchor's shank in a tubular mandrel, said mandrel having a flight near its bottom end of substantially the same pitch as the anchor's flight, with the mandrel's flight constituting an effective continuation of the anchor's flight;

b. placing the tip of the anchor in contact with the earth and rotating the anchor in a direction to cause its entrance into the earth, with anchor rotation being accomplished by rotating the enveloping mandrel so as to apply torsional loads to the anchor near the anchor's flight; and

c. after the anchor has been rotated sufficiently to achieve a desired depth in the earth, rotating the mandrel in the opposite direction to cause it to separate from the anchor and to back out of the earth through substantially the same cut that was made when the anchor was turned into the earth.

3,952,524

PIPE LAYING METHOD AND APPARATUS

Burgess F. Rand, 1011 NE. Eighth Ave., Fort Lauderdale, Fla. 33304, and Dane R. Hancock, 822 SW. 14th St., Fort Lauderdale, Fla. 33315

Filed Jan. 4, 1974, Ser. No. 430,701

Int. Cl.² E01G *4/04*

U.S. Cl. 61—43 **2 Claims**

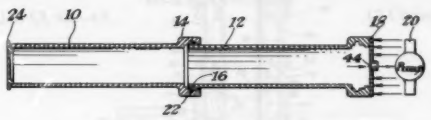
1. The method of joining together a first conduit having first and second open ends and a second conduit having first and second open ends in a substantially incompressible liquid environment comprising the steps of:

a. positioning the second free end of said first conduit adjacent the first free end of said second conduit;

b. placing a sealed liquid barrier over the first free end of said first conduit;

c. placing a sealed liquid barrier over the second free end of said second conduit, said second free end barrier having a pump disposed therethrough;

d. pumping said substantially incompressible liquid from within said first and second conduits out through the second free end of said second conduit along the longitudinal axis of said first conduit whereby the reduced liquid pressure within the first and second conduit form a pressure differential across the first end of said conduit and the second end of said second conduit creating a longitudinal axial force joining the first and second conduits together.



3,952,525

MINE ROOF SUPPORT

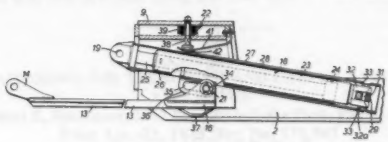
John Hirst Walker; Dennis Franklin Rutherford, and James Anthony Sutton, all of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Tewkesbury, England

Filed Oct. 11, 1974, Ser. No. 514,261

Claims priority, application United Kingdom, Oct. 18, 1973, 48620/73; July 20, 1974, 32251/74

Int. Cl.² E21D *15/52*

U.S. Cl. 61—45 D **19 Claims**



1. A mine roof support intended to stand on a mine floor and having an advancing jack capable of advancing the support by extension of its length, a first pivotal joint on the support to which the advancing jack is secured, a second pivotal joint secured to the jack such that change of jack length will change the spacing between the pivotal joints, an anchorage connection secured to the second pivotal joint to locate the second pivotal joint closer to the floor than the first pivotal joint such that extension of the advancing jack to advance the support exerts on the first pivotal joint a force having one component parallel to the direction of advancing and another component which lifts, or tends to lift, the support from the floor.

3,952,526

FLEXIBLE SUPPORTIVE JOINT FOR SUB-SEA RISER FLOTATION MEANS

Bruce J. Watkins, Rancho Palos Verdes; Albert M. Regan, Huntington Beach, and William P. Slota, Northridge, all of Calif., assignors to Regan Offshore International, Inc., Torrance, Calif.

Filed Feb. 3, 1975, Ser. No. 546,710

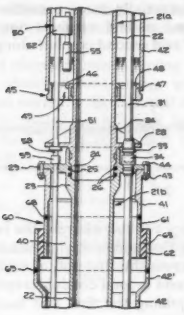
Int. Cl.² E21B *7/12*

U.S. Cl. 61—46 **23 Claims**

1. In a flotation means for a subsea well riser including at least one bouyancy chamber, the improvement comprising the provision of:

means comprising an elastomeric member in sole supporting relation between said chamber and said riser for

providing a flexible supportive joint between said buoyance chamber and said riser whereby said chamber is



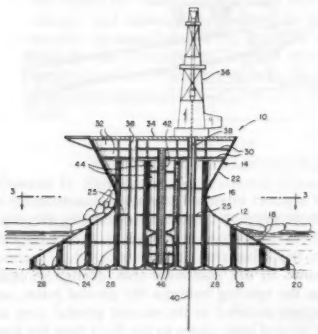
supported only by said elastomeric member from and flexible relative to said riser.

3,952,527

OFFSHORE PLATFORM FOR ARCTIC ENVIRONMENTS

Edward R. Vinieratos, Oxnard, Calif.; Robert E. Levien, Seattle, and Frank W. Purdy, Lynnwood, both of Wash.

Continuation of Ser. No. 313,862, Dec. 11, 1972, abandoned.
This application Nov. 11, 1974, Ser. No. 522,776
Int. Cl.² E02B *15/02*; F24J *1/00*; F25D *23/12*
U.S. Cl. 61—46.5 15 Claims



1. A movable offshore structure for resisting external ice forces and for supporting working platforms and the like comprising:

a. a generally side-enclosed external shell defined by a lower base position with an upwardly and inwardly angling surface and an upper supporting section with an upwardly and outwardly extending surface, said upper and lower sections together defining a waist deflector area, said offshore structure being substantially closed on the bottom so as to be made bouyant and floatable,

b. a plurality of compartments within said shell, each capable of being independently filled with and emptied of freezable fill material, so that when said compartments are filled the structure will rest on the ocean floor and when empty the structure will be floatable and movable, said compartments being supported relative to one another by an internal supporting framework,

c. refrigeration means for freezing said fill material, and

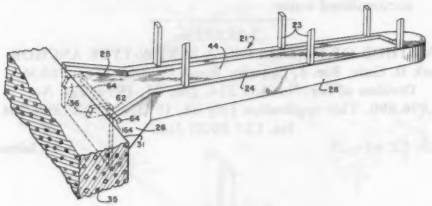
d. at least one working deck located generally on top of said shell and said compartments for supporting work equipment and the like.

3,952,528

BOAT DOCK STRUCTURES

Arie Donkersloot, P.O. Box 50, St. James, Fla. 33956

Continuation-in-part of Ser. No. 335,710, Feb. 26, 1973. This application Mar. 28, 1974, Ser. No. 455,736
Int. Cl.² E02B *3/20*
U.S. Cl. 61—48 17 Claims



13. A boat dock structure to be installed at a water situs such as a seashore, river bank or the like, wherein the dock structure is secured at the edge of the shore ground, said dock structure including:

a. an elongate body comprising a base portion at a first end thereof and a head portion at the second end thereof, the elongate body formed of steel sheet sections defining a top wall, two side walls and a bottom such as to form a generally rectangular cross section,

b. structural means embedded at the edge of the shore ground and constructed to receive the base portion of the elongate body, said structural means including a metal boundary wall,

c. connecting means directly engaged between the base portion of the elongate body and the boundary wall for rigidly affixing the base portion to the structural receiving means embedded at the shore,

1. said connecting means including mating angular components affixed respectively to the metal boundary wall and the base portion, and means rigidly uniting said components to preclude movement therebetween,

2. said connecting means firmly holding and supporting the elongate body horizontally such as to extend over and above the body of water without touching the water,

d. pillar means engaged with and depending from the head portion of the elongate body, said pillar means being anchored in the floor beneath the water and constituting in conjunction with the connecting means for connecting the base portion to the structural receiving means, the support structure for said elongate body, and

e. individual guard rail stanchions fastened to the top of the elongate body for tying boats to the dock.

3,952,529

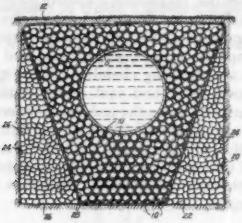
EARTHQUAKE FAULT ZONE PIPELINE CONSTRUCTION METHOD AND ARRANGEMENT

Kenneth W. Lefever, Waterford, Va. 20246

Filed Apr. 12, 1974, Ser. No. 460,592
Int. Cl.² E02D *27/46*, *31/00*; F16L *1/00*
U.S. Cl. 61—72.1 15 Claims

1. The method of installing a pipeline across an earthquake fault zone whereby earth shocks and shifts in the position of the earth resulting from an earthquake can be accommodated without rupturing the pipeline, comprising the steps of: digging a trench across said zone, said trench being of sufficient width and depth to accommodate the diameter of the pipeline, and to further accommodate expected shifts of the earth that might occur during an earthquake, the sidewalls of said trench being spaced apart a distance substantially greater than the diameter of said pipeline; placing a lower bed of spherical bodies within said trench, up to a depth where it is desired to position a pipeline; laying the pipeline in the trench upon said

lower bed of spherical bodies and spaced substantially from the sidewalls of the trench; and filling said trench with an upper bed of said spherical bodies to bury said pipeline, with



the top surface of said upper bed of spherical bodies being left substantially unrestrained to allow for substantially free upward vertical movement of one or more of said spherical bodies during an earthquake.

3,952,530

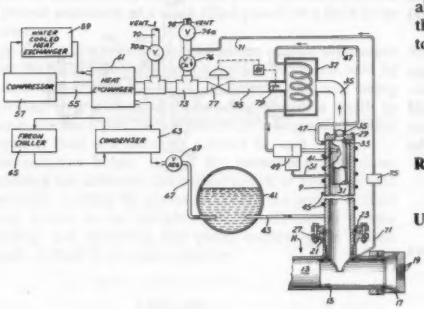
CO_2-SNOW-MAKING

Lewis Tyree, Jr., 10401 S. Oakley Ave., Chicago, Ill. 60643

Filed Aug. 20, 1974, Ser. No. 499,035

Int. Cl.² F25J *1/00*

U.S. Cl. 62—10 **13 Claims**



1. In a method of controlling a CO_2 snow-making operation, which method includes

expanding liquid CO_2 through a nozzle to create a mixture of CO_2 snow and cold CO_2 vapor,

centrifugally separating said snow and vapor and feeding said snow to a generally closed chamber, and removing a major portion of said cold CO_2 vapor through first conduit means during normal operation,

the improvement comprises continuously warming said cold CO_2 vapor flowing through said first conduit means, measuring a thermodynamic variable characteristic of said CO_2 vapor, selected from the group consisting of temperature and pressure, subsequent to said warming step to detect a change in said variable, and

decreasing the rate of flow of said CO_2 vapor in said first conduit means responsive to said change in said variable and

controlling flow of CO_2 vapor from the generally closed chamber at a greater rate than that characteristic of normal operation

whereby temporary reduction of the rate of flow of said CO_2 vapor through said first conduit means resultant from said decrease, upon detecting change in said variable indicative of incomplete separation of snow from vapor due to an upset in said method results in prompt correction of the said upset.

3,952,531

CRYOGENIC STORAGE TANKS

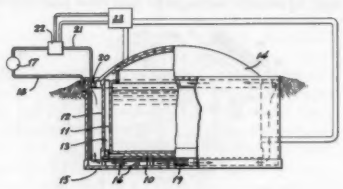
Frederick Henry Turner, Reading, England, assignor to Simon-Carves Limited, Stockport, England

Filed Jan. 2, 1974, Ser. No. 429,842

Claims priority, application United Kingdom, Jan. 31, 1973, 4923/73

Int. Cl.² F17C *3/10*

U.S. Cl. 62—45 **12 Claims**



1. An at least partially subterranean cryogenic storage tank for the storage of low temperature liquids characterised by the provision of means defining an enclosed fluid conductive space between the bottom and side walls of the tank and the adjacent ground below ground level, and means for continually introducing heated air into said space at the lower regions thereof for heat exchange flow therethrough along said bottom wall and upwardly along said side wall.

3,952,532

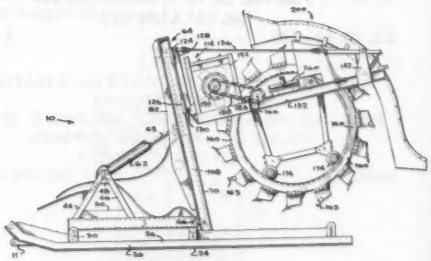
UNDERWATER TRENCHING AND CABLE LAYING APPARATUS

Robert R. Spearman, 2367 Bay Circle, Lake Park, Fla. 33410

Filed Apr. 23, 1975, Ser. No. 570,945

Int. Cl.² E02F *5/02*; **B63B** *35/04*

U.S. Cl. 61—72.4 **11 Claims**



1. An underwater excavating means for digging a trench in the bottom of a body of water comprising:

a supporting vehicle capable of movement across the bottom of a body of water,

mechanical digging means capable of underwater operation including a power driven rotary digging wheel,

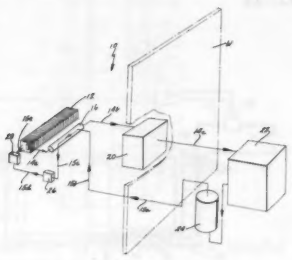
adjustable support means supporting said rotary digging wheel for rotation about a horizontal axis and for vertical adjustment with respect to said vehicle, and hydraulic motor means mounted on said adjustable support means drivingly connected to said rotary digging wheel for rotating said digging wheel.

3,952,533

MULTIPLE VALVE REFRIGERATION SYSTEM

William C. Johnston, Atlanta, Ga., and Sterling Beckwith, Menlo Park, Calif., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Sept. 3, 1974, Ser. No. 502,439
Int. Cl.² F25B 41/00
U.S. Cl. 62—115 5 Claims



1. A continuous two-phase refrigeration system including refrigerant compressor means for compressing gaseous refrigerant, outside air cooled condenser means for cooling the compressed refrigerant, sub-cooler means for further cooling the compressed refrigerant with evaporator discharge refrigerant gas, evaporator means for heat exchange cooling of fluid therearound, and conduit means interconnecting said several means, the improvement comprising:

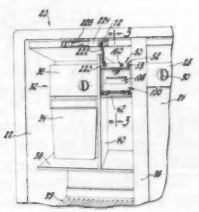
two-phase-refrigerant pressure regulator valve means for regulating refrigerant pressure and two-phase-refrigerant expansion valve means for refrigerant expansion, in succession along said conduit means, downstream of said sub-cooler means and upstream of said evaporator means, whereby a two-phase liquid-gas refrigerant can be continuously recirculated through the system.

3,952,534

ICE CREAM MAKER FOR REFRIGERATOR

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 24, 1975, Ser. No. 552,429
Int. Cl.² A23G 9/12
U.S. Cl. 62—136 5 Claims



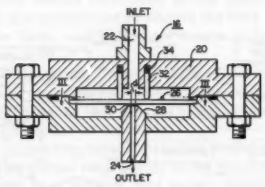
1. A frozen confection-making appliance for use in the freezer compartment of a refrigerator normally maintained at a below-freezing temperature, said appliance including a housing with an access opening having a freezing chamber and a machinery compartment separated by partition means, a freezing container for holding the confection to be congealed with said container adapted for removable reception in said housing freezing chamber, confection mixing means supported in said container, an electric motor disposed within said machinery compartment, said motor including an armature having first and second shaft portions, said first shaft portion connected to drive train means, said second shaft portion being drivingly connected to fan means, releasable coupling means for connecting said mixing means to the output of said drive train means upon insertion of said container into said chamber, thermostatic control means for declutching said first shaft portion from said drive train means, said fan means operative for drawing below-freezing air from said freezer compartment into said housing and through passage means into said freezing chamber in heat exchange relation with the confection, and said thermostatic control means being operative to sense the reduced temperature of the confection in said container, whereby said first shaft portion is automatically declutched from said drive train resulting in the stoppage of said mixing means while said motor continues to drive said blower means to circulate below freezing air over said container.

3,952,535

AUTOMATIC EXPANSION VALVE FOR REFRIGERANT

Thomas H. Putman, Pittsburgh, Pa., assignor to White-Westinghouse Corporation, Cleveland, Ohio

Continuation of Ser. No. 383,425, July 27, 1973, abandoned.
This application Oct. 3, 1974, Ser. No. 511,972
Int. Cl.² F25B 41/04
U.S. Cl. 62—222 10 Claims



1. A mechanical refrigeration air conditioning system including:

a refrigeration compressor;

a refrigeration condenser operating at varying relatively higher pressures in normal operation;

a refrigerant evaporator operating at varying relatively lower pressures in normal operation;

a refrigeration expansion valve connected to receive substantially liquid refrigerant from said condenser and to discharge substantially expanded vaporous refrigerant to said evaporator, said valve having a deflectable member and stationary structure spaced therefrom to define a variable size refrigerant expansion orifice therebetween,

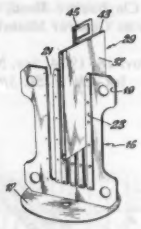
the face areas of said member upstream from said orifice being exposed to the pressure of said liquid refrigerant, and the face areas of said member downstream from said orifice being exposed to the pressure of said vaporous refrigerant,

the transverse area of said orifice, the stiffness of said deflectable member, and the distance between said member and said stationary structure being related to the range of differential pressures encountered in normal operation of the system to provide on the average increasing and decreasing refrigerant flow rates with increasing and decreasing differential pressures, respectively, of said liquid and vaporous refrigerant.

3,952,536
APPARATUS FOR CRYOGENIC FREEZING OF FLUID FILLED POUCHES

Clifford C. Faust, Riverside, and Philip F. Cilia, Bridgeview, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 30, 1971, Ser. No. 176,214
Int. Cl.[2] F25D 3/10
U.S. Cl. 62—293 7 Claims



1. Apparatus for cryogenically freezing fluids in flexible pouches into thin layer-like unitary articles comprising, in combination,

a. a container suitable for containing a cryogenic medium having a temperature on the order of about −196°C.

b. a pair of substantially flat parallel planar plates separable to permit enclosure of a slack filled pouch of a fluid to be frozen,

c. a jig fixture for restraining said plates against separation from the slack filled pouch of a fluid to be frozen, said jig fixture being immersible in said container and being provided with a vertically extending slot of a width to accommodate a pair of said plates enclosing a slack filled pouch of fluid in a slideable contact fit, and

d. manipulative holder means for immersing the plates enclosing the unfrozen slack filled pouch of fluid into said container, holding the plates enclosing the pouch of fluid being frozen in an upright vertical orientation during freezing, and removing said plates enclosing the frozen pouch of fluid from said container.

3,952,537
REVERSING VALVE MEANS FOR USE WITH A REVERSIBLE REFRIGERATING CYCLE SYSTEM

Tadashi Aoki, Iruma, and Yasuo Komiya, Tokyo, both of Japan, assignors to Kabushiki Kaisha Saginomiya Seisakusho, Tokyo, Japan

Filed Oct. 2, 1974, Ser. No. 511,273
Int. Cl.[2] F25B 29/00
U.S. Cl. 62—324 7 Claims

1. A reversing valve means for use with a reversible refrigerating cycle system comprising first and second means functioning alternately and in reverse as a condenser and an evaporator;

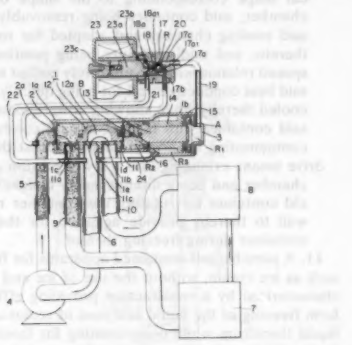
a compressor means associated with said first and second means;

a cylindrical reversing valve body associated with said first and second means and with said compressor means, said reversing valve body having first and second ports communicating with pipes of said first and second means respectively, a third port located between said first and second ports and communicating with a suction pipe of the compressor and a fourth port communicating with a discharge pipe of the compressor, said first, second and third ports being provided at one side of said reversing valve body in alignment with one another axially of said reversing valve body;

a valve seat having three holes each corresponding to said first, second and third ports, respectively;

a selector valve connected with a valve rod, said valve rod having a first larger pressure-sensing portion and a second smaller pressure-sensing portion, said selector valve and valve rod being movable within said reversing valve body in the axial direction thereof by means of differing pressures on said first and second pressure-sensing portions, said selector valve having a concave thereunder adapted to connect said third port selectively with said second port and said first port and being slidable on said valve seat;

a switchover section associated with said reversing valve body and having a common passage, a first passage in communication with said compressor discharge pipe for



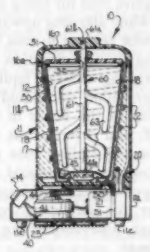
introducing high-pressure refrigerant to said switchover section, a second passage in communication with said compressor suction pipe for introducing low-pressure refrigerant to said switchover section; and

a pilot electromagnetic valve means adapted to connect said common passage selectively with said first passage and said second passage, said movable valve rod dividing the valve body into fixedly located first and second rooms each having an end closed by said larger pressure-sensing portion and smaller pressure-sensing portion, respectively, said fourth port opening into said second room, said larger pressure-sensing portion of said valve rod being in communication with said common passage of said switchover section.

3,952,538
PORTABLE SELF-CONTAINED APPARATUS FOR FREEZING LIQUIDS

Stearn W. Warlick, Rte. 1, Box 85, Lincolnton, N.C. 28092

Filed Nov. 20, 1974, Ser. No. 525,475
Int. Cl.[2] A23G 9/10
U.S. Cl. 62—342 11 Claims



6. A portable self-contained apparatus for freezing liquids, such as ice cream, without the use of ice and salt and being characterized by a construction providing efficient and uni-

form freezing of the liquid and ease of removal of the frozen liquid therefrom while compensating for frost accumulation during the freezing operation, said apparatus comprising:

a housing;

a heat conductive wall of generally frusto-conical configuration carried by said housing and defining therein an upwardly flaring frustoconical cooling chamber having an open upper end;

refrigeration means contained in said housing and cooperating with said heat conductive wall over substantially the entire extent thereof for circulating a refrigerant therealong for uniformly cooling the inner surface of said wall;

a heat conductive liquid container of generally frusto-conical shape corresponding to the shape of said cooling chamber, said container being removably positioned in said cooling chamber and adapted for rotation relative thereto, and said container being positioned in closely spaced relation with the uniformly cooled inner surface of said heat conductive wall for being quickly and uniformly cooled thereby while allowing upward axial movement of said container with respect to said conductive wall for compensating for accumulation of frost thereon; and

drive means extending into a lower portion of said cooling chamber and being disengageably connected to said liquid container for rotating the container relative to said wall to thereby provide agitation for the liquid in the container during freezing thereof.

11. A portable self-contained apparatus for freezing liquids, such as ice cream, without the use of ice and salt and being characterized by a construction providing efficient and uniform freezing of the liquid and ease of removal of the frozen liquid therefrom while compensating for frost accumulation during the freezing operation, said apparatus comprising:

a housing, including a hollow base portion and an upper housing portion carried by said base portion and extending upwardly therefrom;

a heat conductive wall of generally frusto-conical configuration located in said upper housing portion and defining therein an upwardly flaring frusto-conical cooling chamber having an open upper end;

refrigeration means cooperating with said heat conductive wall over substantially the entire extent thereof for circulating a refrigerant therearound for uniformly cooling the inner surface of said wall, said refrigeration means including a refrigeration compressor located in said hollow base portion below said cooling chamber, a condenser coil operatively connected to said refrigeration compressor, and an evaporator coil surrounding said heat conductive wall and being operatively connected to said refrigeration compressor and to said condensor coil;

a heat conductive liquid container of generally frusto-conical shape corresponding to the shape of said cooling chamber, said container being removably positioned in said cooling chamber and adapted for rotation relative thereto, and said container being positioned in closely spaced relation with the uniformly cooled inner surface of said heat conductive wall for being quickly and uniformly cooled thereby while allowing upward axial movement of said container with respect to said heat conductive wall for compensating for accumulation of frost thereon;

drive means cooperating with said liquid container for rotating the container within said liquid chamber to thereby provide agitation for the liquid in the container during freezing thereof, said drive means including an electric motor located in said hollow base portion, a drive gear located in the lower portion of said cooling chamber and being releasably connected in driving engagement to said liquid container for imparting rotation thereto, and means operatively interconnecting said electric motor and said drive gear;

a dasher extending into said liquid container from the upper end thereof; and

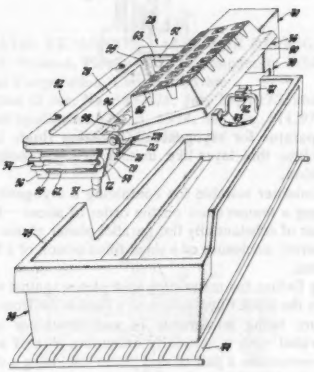
a cooling chamber cover carried by said upper housing and enclosing the open end of said cooling chamber, said cover including means engaging the upper end of said dasher for holding the dasher stationary during rotation of the liquid container to thereby provide further agitation to the liquid in said container to facilitate uniform freezing thereof.

3,952,539

WATER TRAY FOR CLEAR ICE MAKER

Robert S. Hanson, 159 Marbrook Drive, Kettering, and Cecil C. Pugh, 1210 Claybourne Road, Dayton, both of Ohio 45429, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 18, 1974, Ser. No. 524,974
Int. Cl.² F25C *5/08*
U.S. Cl. 62—351 **2 Claims**



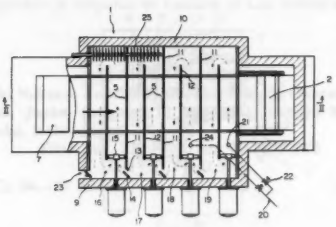
2. A clear ice maker in a freezer comprising a tray having side and bottom walls adapted to contain a body of water, a grid in said tray having cavity-forming means for displacing the body of water contained by said walls into the cavity, fan means distributing sub-freezing air over the top planar surface of said body of water in said grid cavity for a sufficient period to initiate the freezing of clear ice in said grid cavity along the interface between said air and said top planar surface and to continue the freezing of clear ice downwardly in said grid cavity, and a bucket for storing said clear ice in said freezer and being removable from said freezer, heating means energizable to maintain said body of water in a liquid state adjacent said tray below the freezing clear ice, harvesting mechanism for removing said grid and clear ice from said tray before the freezing of clear ice downwardly in said grid cavity reaches the bottom wall of said tray and depositing said clear ice in said bucket, the improvement in said tray heating means comprising a composite tray having a polypropylene plastic frame with side, end and bottom walls formed with window-like apertures therein, aluminum metal insert plates positioned in said apertures, said plates having a thickness of about one and one-half times the thickness of said tray plastic frame, said plate peripheral edges formed with undercut grooves to provide a single lap-butt sealed joint with the edges of the tray apertures, a first resistance heater for said side and end wall insert, a second heater for said bottom wall insert, said side and end wall metal inserts having a vertical dimension substantially coextensive with the clear ice cubes in said grid from said top planar surface to the lower surface of the clear ice cubes, said bottom wall insert of a dimension to be coextensive with the bottom openings of said grid cavities, said first side wall heater operative to heat said side and end wall inserts, and said second bottom wall heater operative to maintain said body of water beneath the freezing clear ice at an above freezing temperature.

3,952,540

APPARATUS FOR COOLING GOODS BY CONTACTING THE GOODS WITH LOW TEMPERATURE GAS

Nobuhiko Okada, Nara; Shunroku Yamashita, Takatsuki, both of Japan, and Teikoku Sanso Kabushiki Kaisha, 03, Tokyo, both of Japan, assignors to Osaka Gas Kabushiki Kaisha, Osaka and Teikoku Sanso Kabushiki Kaisha, Tokyo, both of, Japan

Filed Oct. 30, 1973, Ser. No. 410,998
Claims priority, application Japan, Oct. 31, 1972, 47-109709; Sept. 27, 1973, 48-109035
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—374 10 Claims



1. An apparatus for cooling goods through contact with a low temperature gas comprising, in combination:

a housing;

a conveying means mounted in said housing for intermittently transferring the goods in a substantially rectilinear direction through said housing;

wall means arranged substantially equidistantly in vertical relation to a goods transferring path through a space between an upper surface of said conveying means and an upper surface of said housing, said wall means being adapted to shift intermittently together with said conveying means;

recesses in said housing defined by outwardly protruding portions of two side walls thereof which face said space between an upper surface of said conveying means and an upper inner surface of said housing;

first and second partition means provided in said recesses in substantially parallel relation to and respectively at intervals twice those of said wall means, said first and second partition means being arranged alternatingly and equidistantly, said second partition means having oppositely disposed end portions adapted to stop short of said side walls to thereby form gaps between the said partitions and said side walls, said wall means being placed in alignment respectively with said first partition means and with said second partition means when said conveying means is standing still;

at least one precooling space and at least one cooling space defined by said wall means, said first partition means, and said housing, said cooling space being located forward of said precooling space with respect to a direction of transferring goods, said first partition means being provided with a passage for supplying a low temperature gas from said cooling space into said precooling space;

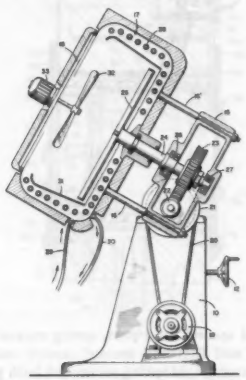
fan means provided in said cooling space and said precooling space respectively for propelling the low temperature gas so as to cause it to circulate in a substantially horizontal circuitous path in a direction transverse to the path of travel of said goods under guidance of said second partition means and said wall means placed in alignment within both of said cooling and precooling spaces.

3,952,541

APPARATUS FOR QUICK FREEZING OF AQUEOUS SOLUTIONS OR SUSPENSIONS TO BE SUBMITTED TO LYOPHILIZATION

Mario Rigoli, Via Falloppio, 5, Milan, Italy

Continuation of Ser. No. 194,070, Oct. 29, 1971, abandoned, which is a continuation of Ser. No. 872,679, Oct. 30, 1969, abandoned. This application Dec. 20, 1974, Ser. No. 534,775
Claims priority, application Italy, Nov. 5, 1968, 133846/68[U]; Oct. 16, 1969, 23480/69
Int. Cl.[2] F26B *5/06*
U.S. Cl. 62—381 2 Claims



1. An apparatus for quick freezing aqueous solutions or suspensions contained in vials, for subsequent lyophilization, in such a manner that said solution or suspension forms a thin frozen layer substantially on the entire inner surface of the side walls of the vials, said apparatus comprising: a tank having integral bottom and side walls and one open end, an air-tight cover for closing said open end, refrigeration means in said bottom and side walls of said tank, tank mounting means to adjustably position the longitudinal axis of the tank between horizontal and vertical positions, at least one rotatable frame mounted within said tank, means on said frame for holding trays for housing a plurality of vials, a centrally disposed rotatably driven shaft passing through the bottom of the tank and connected for driving said rotating frame, and means for refrigerating each vial from its top to its bottom including an impeller disposed centrally inside the cover, a motor disposed externally of the cover and connected for rotatably driving said impeller for producing a descending stream of refrigerated air within the central portion of said tank, air conveyor means mounted within the tank parallel to, but spaced from, said side walls defining an annular outer chamber and a coaxial cylindrical inner chamber, said impeller and air conveyor means forming a closed air circuit for said descending refrigerated stream of air in said inner chamber for lapping the entire surface of the vials from top to bottom and for a rising stream of air in said annular chamber for rapidly freezing the solution or suspension within the vials starting from the top until a thin frozen layer covers the walls of the vials.

3,952,542

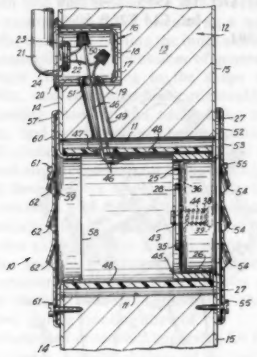
VENTILATOR

Irving L. Berkowitz, Binghamton, N.Y., assignor to Kason Hardware Corporation, Binghamton, N.Y.

Filed Nov. 22, 1974, Ser. No. 526,265
Int. Cl.[2] F25D *17/04*
U.S. Cl. 62—409 10 Claims

1. A ventilator for use in controlling the flow of fluid such as air to and from an enclosure or the like, the enclosure including a supporting wall defining a ventilating opening

therethrough, the improvement comprising: a valve assembly having portions thereof disposed within said ventilating opening, said valve assembly including a substantially fluid impervious wall formed with a guide opening therethrough and further defining first and second fluid ports therethrough, a first closure member springbiased toward a normally closed position such that portions thereof substantially cover said first fluid port, a second closure member spring-biased toward a normally closed position such that portions thereof substantially cover said second fluid port, spring means for causing said biasing of said first and second closure members, and guide means carrying said spring means for both guiding each of said closure members between said closed positions and open positions, respectively, and for maintaining a substantially predetermined alignment between said closure members with respect to one another as well as with respect to the disposition of said ports, said valve assembly permitting substantial equalization of fluid pressure differentials at said ventilating opening.

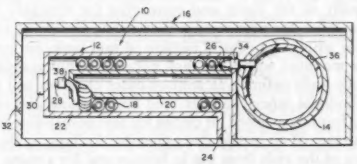


3,952,543

QUICK COOLING CRYOSTAT WITH VALVE UTILIZING SIMON COOLING AND JOULE THOMPSON EXPANSION

J. Stanley Buller, Santa Barbara, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 13, 1974, Ser. No. 532,355
Int. Cl.² F25B *19/00*
U.S. Cl. 62—514 JT **9 Claims**



1. A cryostat comprising:

a Simon expansion tank for containing refrigerant gas under pressure, at least an interior layer in said Simon expansion tank having a lower thermal conductivity than of solid metal, outlet means from said Simon expansion tank for discharging expansion cooled gas from the interior of said Simon expansion tank for the cooling of the remaining gas in said Simon expansion tank, said outlet means also being constructed for minimizing heating of said expansion cooled gas during transfer;

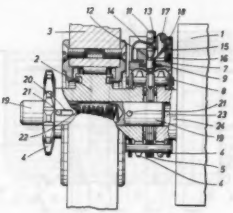
a Joule Thomson coldfinger having its inlet coupled to the outlet of said Simon expansion tank to receive the expansion cooled gas by transfer from said outlet means and valve means for holding the refrigerant gas under pressure in said Simon expansion tank until cooldown and for releasing refrigerant gas from said Simon expansion tank directly through said Joule Thomson coldfinger upon opening of said valve.

3,952,544

SHAFT-CONNECTING CHAIN COUPLING

Walther Filter, Langenhagen, Germany, assignor to Vereinigte Osterreichische Eisen-und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria and Etablissement Wanderfield & Co., Schaan, Liechtenstein

Filed June 27, 1974, Ser. No. 483,685
Claims priority, application Austria, July 25, 1973, 6563/73
Int. Cl.² F16D *3/70;* **F16H** *57/04*
U.S. Cl. 64—19 **4 Claims**



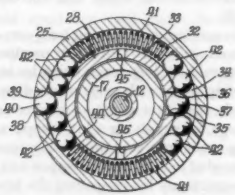
1. In a chain coupling for connecting two shafts, which comprises two substantially coaxial sprockets, a chain trained around the sprockets, and a chain fastener comprising two fastener members connected to respective ends of the chain, the improvement of one of the fastener members defining an aperture, a keeper mounted in the other fastener member and extending in the longitudinal direction of the chain, the keeper being matingly received in the aperture and defining an aperture having an axis normal to the axis of the sprockets, and a locking pin adapted to assume a first position, in which the locking pin locks the two fastener members together, and a second position, in which the locking pin permits the two fastener members to be separated from each other, the locking pin being movable between the first and second positions in a plane normal to the axis of the sprockets, and the locking pin extending into the aperture in the keeper in the first position and being disposed outside the aperture in the keeper in the second position.

3,952,545

FLUID DAMPED RESILIENT DRIVE FOR A GOVERNOR

Werner H. Koeslin, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 3, 1974, Ser. No. 485,338
Int. Cl.² F16D *3/14*
U.S. Cl. 64—27 C **11 Claims**



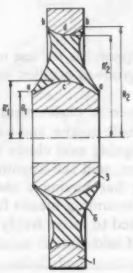
1. A resilient drive mechanism in combination with a governor controlled fuel control means, said resilient drive mechanism comprising

a rotary driving member,
a rotary driven member,
means defining an annular raceway between said driving and driven members, and
resilient coupling means interconnecting said driving and driven members together comprising spring means, a plurality of connecting members loosely mounted in said raceway to abut said spring means in circumferentially disposed relationship therewith for damping vibrations in said resilient drive mechanism and stop means secured to each of said driving and driven members to radially extend into said raceway and each stop means interposed between and solely abutting a respective pair of circumferentially adjacent connecting members, and wherein
said governor controlled fuel control means includes a movable fuel control member and is operatively connected to said driven member for moving said fuel control member in response to rotation of said driven member.

3,952,546
ELASTIC COUPLING

Hideaki Nakano; Tadahiro Ozu, and Takashi Okayama, all of Kobe, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Aug. 23, 1974, Ser. No. 499,952
Int. Cl.² F16D 3/14
U.S. Cl. 64—27 NM **6 Claims**



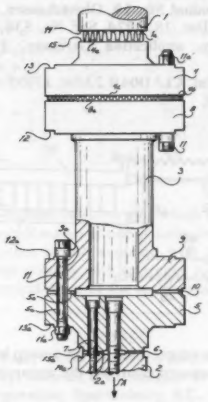
1. An elastic coupling comprising an inner metal ring having its radially outer surface radially curvilinearly convexed, an outer metal ring having its radially inner surface radially curvilinearly convexed, and an elastomer ring interposed between said inner and outer metal rings and having its radially inner and outer surfaces radially curvilinearly concaved and vulcanized, respectively, to the correspondingly contoured outer surface of said inner metal ring and to the inner surface of said outer metal ring, such that the modulus of shearing strain of a surface portion at the side of said elastomer ring is smaller than that of an inside portion of the same to eliminate initial tension within the surfaces of said elastomer ring.

3,952,547
METHOD AND MEANS FOR ACCURATELY ALIGNING THE AXES OF SHAFTS IN PUMP ASSEMBLIES OR THE LIKE

Johannes Klein, Frankenthal; Wolfgang Schneider, Hessheim, and Karl Fetzer, Heidenheim, all of Germany, assignors to KSB Kernkraftwerkspumpen GmbH, Frankenthal, Germany

Filed Dec. 5, 1974, Ser. No. 530,043
Claims priority, application Germany, Dec. 10, 1973, 2361367
Int. Cl.² F16D 3/18
U.S. Cl. 64—9 R **10 Claims**

1. In a pump assembly, particularly in a centrifugal pump assembly for use in nuclear reactor plants, a combination comprising a first rotary member having a first face gear at one end thereof; a second rotary member having a second face gear at one end thereof, said face gears being normally in mesh with each other and at least one of said rotary members having an annular control surface located in a plane which is normal to the axis of said one rotary member so that a monitoring of said control surface can detect eventual deviations of the axis of said one rotary member from a position of accurate alignment with the axis of the other rotary member; and means for changing the inclination of at least one of said rotary members with respect to the other rotary member upon

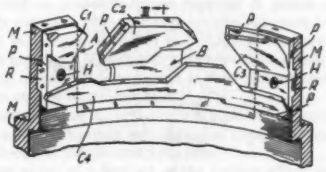


detection of said deviations, including a plurality of adjusting elements spaced apart from each other in the circumferential direction of said rotary members and each urging different portions of said face gears into mesh with each other with a force which is variable to allow for tilting of at least one of said rotary members with respect to the other rotary member upon detection of said deviations until the axes of said rotary members are accurately aligned with each other so that the plane of said control surface is normal to the axes of both rotary members.

3,952,548
CAM RING

Francesco Lonati, Brescia, Italy, assignor to Costruzioni Meccaniche Lonati di Lonati Francesco & Figli (Ettore, Fausto, Tiberio) S.n.c., Brescia, Italy

Filed Jan. 2, 1974, Ser. No. 429,976
Claims priority, application Italy, Jan. 31, 1973, 5104/73
Int. Cl.² D04B 15/32
U.S. Cl. 66—57 **1 Claim**



1. An improvement in the drive cam ring set of a circular knitting machine, comprising:
an annular shaped rigid skirt;
a plurality of arcuate plate members each having a positioning means for positioning each said arcuate plate member within said annular shaped rigid skirt; and
at least two cams formed integrally on each of said arcuate plate members, said cams forming a guide path having slots along portions of said path between portions of said

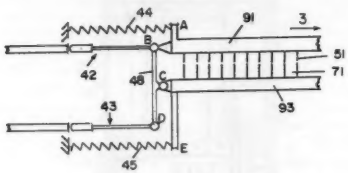
cams, said annular shaped rigid skirt having apertures at locations around its circumference adjacent said slots thereby providing radial openings through both said annular shaped rigid skirt and said arcuate plate members.

3,952,549

GUIDEBAR COMPENSATION APPARATUS FOR USE ON WARP KNITTING MACHINES EQUIPPED WITH JACQUARD CONTROLS

Karl Kohl, Chlorodont Str. 10, Obertshausen, Germany

Filed Dec. 18, 1974, Ser. No. 534,056
Claims priority, application Germany, Jan. 15, 1974, 2401688
Int. Cl.² D04B 23/00, 27/00
U.S. Cl. 66—86 E 7 Claims



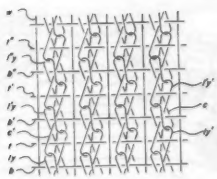
1. An apparatus adapted for use on a warp knitting machine equipped with Jacquard controls, the apparatus comprising:
a guide bar;
a guide bar control means;
a dropper bar associated with said guide bar;
a dropper bar control means;
return means for biasing said guide bar and dropper bar against their respective control means; and,
a compensation means for increasing the bias force upon said guide bar in one direction when the movement of said dropper bar is in the opposite direction, said compensation means comprising a lever means pivotally connected to said guide bar and to said dropper bar.

3,952,550

KNIT FABRIC INCORPORATING A WARP STITCH WEAVE

Kurt W. Niederer, Charlotte, N.C., assignor to W. Schlafhorst & Co., Monchengladbach, Germany

Division of Ser. No. 423,484, Dec. 10, 1973, Pat. No. 3,884,054. This application Jan. 6, 1975, Ser. No. 538,892
Int. Cl.² D04B 23/02
U.S. Cl. 66—87 8 Claims



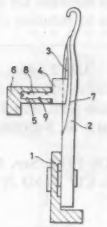
1. In the formation of knit fabric incorporating an inlay of spaced warp ends with filling ends laid at opposite sides of said warp ends across the full fabric width and warp knit stitch chains formed in the spaces between said warp ends, the improvement which comprises feeding said warp and filling end inlay while forming said stitch chains from knitting ends and causing loops of the stitch chains as they are formed to interlace sinuously with filling ends at both sides of the warp ends, so that the filling ends are held against the warp ends and are forced inwardly therebetween causing both warp and filling ends to undulate as a result of mutual interaction in a manner producing an appearance approaching that of woven structure.

3,952,551

SELF-ALIGNING APPARATUS FOR USE ON A WRAP KNITTING MACHINE

Karl Kohl, 10 Chlorodont Strasse, Obertshausen, Germany (6053)

Filed Dec. 24, 1974, Ser. No. 536,138
Claims priority, application Germany, Jan. 15, 1974, 2401687
Int. Cl.² D04B 35/04, 35/06
U.S. Cl. 66—120 4 Claims



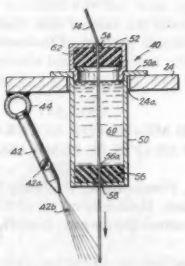
1. A self-aligning apparatus for use on a warp knitting machine equipped with grooved needles, said apparatus comprising:
a needle means; a needle closer means adapted for interaction with said needle means; and a self-aligning means for automatically aligning said closer means with respect to said needle means, said self-aligning means comprising a closer mounting bar having a slot therein and, a slot engaging closer mounting means for carrying said closer means and adapted to move freely along the length of at least a portion of said slot.

3,952,552

AUXILIARY YARN DYEING MECHANISM

Allan Rozner, Fresh Meadows, N.Y., assignor to C.J.I. Industries, Inc., New York, N.Y.

Filed Sept. 29, 1972, Ser. No. 293,352
Int. Cl.² D04B 35/00
U.S. Cl. 66—125 A 2 Claims



2. In a fabric forming machine having a plurality of means each for supplying a yarn to be used in forming a fabric, operating means for incorporating the yarn into a fabric, and means for guiding the yarn toward said operating means, the improvement comprising a plurality of containers each having a dye therein and a yarn passageway therethrough, each of said yarns which is to be dyed being passed through one of said

containers in its path of travel between the respective supplying means and operating means, wherein the yarn passing through each of said containers exits from the container through a hole at one end thereof, and each of said containers includes at least one layer of resilient absorbent material having a channel therethrough and disposed at said one end thereof for guiding a yarn toward said hole in said container, and including a needle for threading said yarn through said container, said needle being of sufficient length for one end thereof to protrude from said hole at said one end of said container while the other end of said needle carrying said yarn protrudes from the other end of said container.

3,952,553
STOPPING APPARATUS FOR A RECTILINEAR KNITTING MACHINE

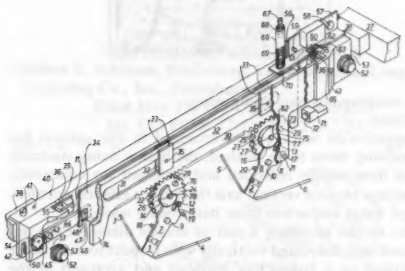
Fritz Kohler, Couvet, Switzerland, assignor to Edouard Dubied et Cie (Societe Anonyme), Couvet, Switzerland

Filed Mar. 21, 1975, Ser. No. 560,968

Claims priority, application Switzerland, Mar. 27, 1974, 4262/74

Int. Cl.² D04B *35/10*

U.S. Cl. 66—157 **2 Claims**



1. A stopping apparatus for a rectilinear knitting machine comprising at least two needlebeds arranged in roof form and provided with needles, a carriage being displaced in an oscillating movement above the frame parts for the control of the needles during its displacement in alternating directions, and at least one apparatus forming one piece with said knitting carriage to move the fabric away from the knitting area of the needles, said stopping means comprising a switch, feed means arranged parallel with the direction of movement of the knitting carriage and control means for this switch, characterized by the fact that it forms one piece with a support concealable about an axis which in turn forms one piece with an apparatus separating the fabric from the operating field of the needles, and that the control means of the switch are adjustable by adjustment means forming one piece with members capable of being displaced perpendicularly to the operating direction of the carriage during a malfunctioning of the knitting machine.

3,952,554
YARN FEED STOP MOTION

Anton Kerff, Ulricehamn, Sweden, assignor to Aktiebolaget IRO, Ulricehamn, Sweden

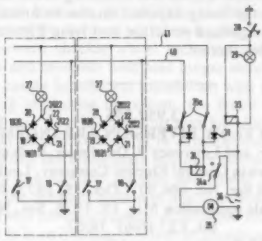
Filed Dec. 27, 1974, Ser. No. 536,900

Claims priority, application Sweden, Dec. 28, 1973, 7317606

Int. Cl.² D04B *35/10*

U.S. Cl. 66—163 **5 Claims**

1. A control device for a textile machine, in particular for a knitting machine having at least one yarn feeding device, each yarn feeding device being provided with two stop-motion devices each respectively having one electrical stop-motion switch, and a relay connected to all stop-motion switches for stopping the mechanical drive of the textile machine, wherein the stop-motion switches of the yarn feeding device are connected to an a-c voltage supplied rectifier circuit in such a manner that the two stop-motion switches of the yarn feeding device are supplied with voltage half-waves of different polarity, and wherein a control unit is provided which is com-



mon to all stop-motion switches and which is capable of suppressing voltage half-waves of one polarity in order to neutralize the stop-motion switch supplied with the voltage half-waves of said one polarity with reference to said relay which stops the mechanical drive of the textile machine.

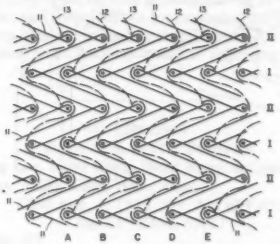
3,952,555
WARP KNIT DENIM FABRICS

Bascum G. Lesley, Pickens, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 13, 1974, Ser. No. 496,952

Int. Cl.² D04B *21/00*

U.S. Cl. 66—195 **16 Claims**



1. A warp knit fabric comprising in combination;

a knitted ground structure comprising a set of similarly colored or colorable yarns disposed in plural, substantially identical paths throughout the structure to form a loop in every wale and in every course, the yarn of each path forming a loop in every course with successive loops being alternately positioned in two non-adjacent wales from course to course, and

a plurality of sets of surface effect yarns of lighter color or colorability than said set of ground structure yarns forming loops in the ground structure,

1. the yarns of a first set of the surface effect yarns disposed in plural substantially identical paths throughout the structure to form loops only in alternate courses, the yarn of each path in said first set forming loops in each alternate course of a single wale and forming inlaid lap portions between said loops, and

2. the yarns of a second set of the surface effect yarns disposed in plural substantially identical paths throughout the structure to form loops only in intervening courses to the courses in which loops of said first set of effect yarns are disposed, the yarn of each path of said second set forming loops in each of said intervening

courses of a single wale and forming inlaid lap portions between said loops,

the yarns of said first and second sets of surface effect yarns forming said loops only in every other wale of the ground structure with the paths of all inlaid lap portions of yarns in said first and second sets extending in the same general direction and being exposed on the technical back surface of the ground structure and lying generally parallel to the wales thereof.

3,952,556

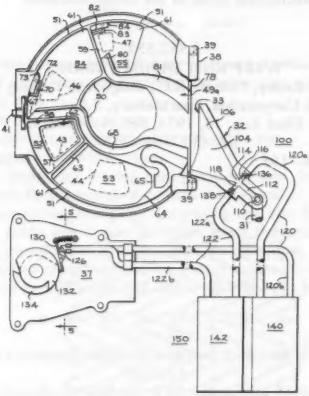
LIQUID FLOW DIVERSION ARRANGEMENT

Ved P. Gakhar, and Lawrence P. Dendinger, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Division of Ser. No. 406,577, Oct. 15, 1973, Pat. No. 3,903,927. This application May 19, 1975, Ser. No. 578,634

Int. Cl.² D06F *39/02*

U.S. Cl. 68—12 R 5 Claims



1. In an automatic washer having an additive dispensing system including a multi-compartmented dispenser, a liquid flow diversion arrangement having a liquid diverter for selectively diverting liquid into preselected dispenser compartments for flushing the additives into the washer at predetermined times during a cycle of the washer, the liquid diverter having a main inlet for liquid to enter, a liquid outlet providing a plurality of exit paths for the liquid, and at least two control ports coupled respectively to ambient, the arrangement further including means for selectively closing each of the control ports respectively from ambient at predetermined times for determining through which exit path and thereby into which dispenser compartment liquid entering the main inlet will emerge, wherein the improvement comprises:

a check valve associated with each control port for preventing the emergence of liquid from the respective control ports; and

a chamber coupled respectively between each control port and its respective closing means for accumulating liquid that may bypass the respective check valves, the chambers being dimensioned for preventing sonic oscillations in the liquid flow diversion arrangement.

3,952,557

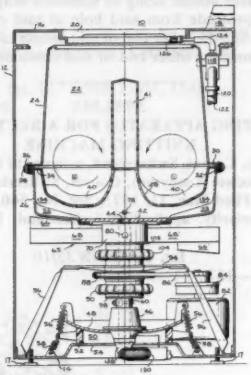
WOBBLE WASHING MACHINE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 20, 1974, Ser. No. 481,201

Int. Cl.² D06F *23/02*

U.S. Cl. 68—23.3 8 Claims



1. A washing machine comprising:

a cabinet;

an imperforate wash basket arranged in the cabinet for receiving items to be washed, the basket being statically and dynamically balanced and arranged for concentric rotation about a vertical axis thereof for effecting centrifugal water extraction from items being washed;

inertia means including a pair of masses diametrically opposed and dislocated vertically with respect to each other secured to a connecting member and arranged in the cabinet below the wash basket for rotation about a vertical axis coaxial with that of the wash basket, the inertia means being balanced statically and forming a dynamically unbalanced couple, and when rotated the basket is caused to oscillate relative to its vertical axis for effecting turnover of items placed therein to be washed, and when the basket is rotated, the inertia means acts to stabilize the mass by counteracting unbalance resulting therefrom;

means arranged in the cabinet for rotating the inertia means while preventing the basket from simultaneously rotating and alternatively for rotating the basket while preventing the inertia means from simultaneously rotating; and

a damped, gyratory suspension system arranged in the cabinet for isolating the cabinet from forces induced by oscillating and rotational motions.

3,952,558

MACHINE FOR DYEING OR OTHER WET-TREATMENT OF TEXTILES

Sven Olof Sandberg, and Sven Robert E:son Smith, both of Avesta, Sweden, assignors to Avesta Jernverks Aktiebolag, Avesta, Sweden

Filed Apr. 1, 1974, Ser. No. 457,097

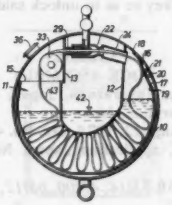
Claims priority, application Sweden, Mar. 28, 1973, 734386

Int. Cl.² D06B *3/28*

U.S. Cl. 68—177 8 Claims

1. Apparatus for dyeing or other wet-treatment of knitted, crocheted or woven textile goods, comprising a vessel containing a bath of treatment liquid, means for circulating the textile goods in web form through said bath, means including a driving jet nozzle above said bath supplied with part of said treatment liquid under pressure for producing a jet drawing the textile goods in the form of a string or rope through said nozzle, the driving nozzle being directed at an angle within the

range of + 45° to the horizontal towards a deflector surface for deflecting the jet and the accompanying textile string or rope in a downward direction towards said bath, said jet nozzle and said deflector surface being separated by a space allowing said web to be carried substantially solely by said jet and unobstructed to said deflector surface to impinge thereagainst so as to spread the jet and the string or rope laterally to cause the textile goods to enter the liquid bath spread out into web form, and means for adjusting said deflector surface into various angular positions.

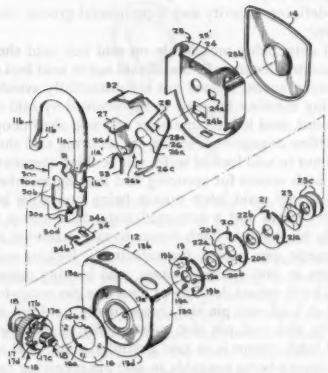


3,952,559

EXPOSED SHACKLE PADLOCK

Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Co., Inc., Petersburg, Va.

Filed May 10, 1974, Ser. No. 469,039
Int. Cl.² E05B *37/10, 67/22, 67/24*
U.S. Cl. 70—25 **29 Claims**



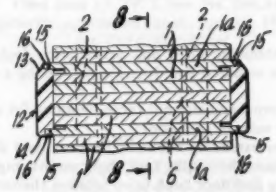
1. An exposed shackle padlock comprising a casing having shackle openings in a top wall thereof for reception of shackle legs, a shackle movable relative to the casing between inner locking and outer release positions having legs extending through said openings including a longer leg supported for axial and rotary movement within the casing and a shorter leg having a latching notch, means defining a stationary pivot in a lower region in the casing, a fence plate having a fence flange and a locking flange integrally formed thereon supported for rocking movement between latching and unlatching positions about a first pivot axis adjacent the pivot and having a slot shaped to accommodate lateral translatory relative movement of the pivot in the slot, said locking flange projecting into locking relation in said latching notch at the inner locking position of the shackle when the fence plate is in latching position, rotatable locking means in said casing including a peripherally gated rotatable tumbler wheel member normally occupying a locking position wherein peripheral portions thereof adjacent said fence flange prevent fence plate movement from said latching position and operable from externally of the casing to occupy an unlocking position disposing its gate to receive the fence flange and accommodate rocking of the fence plate to unlatching position, means operable when the locking means is in said unlocking position for moving the fence plate to unlatching position responsive to initial inward force on the shackle causing inward shackle travel followed by outward withdrawing force on the shackle causing outward shackle travel including an actuator plate coupled to and movable with said longer shackle leg located within the casing in adjacent parallelism with the fence plate having a lug projecting therefrom, the fence plate having a shouldered slot therein receiving said lug shaped to dispose the shoulder portion of the slot in adjacent overlying relation to the lug when the fence plate occupies the latching position to intercept the lug and prevent movement toward release position of the actuator plate and interconnected shackle, the shouldered slot having a passage shaped and located when the fence plate is in unlatching position to accommodate travel of the lug during shackle releasing movement of the actuator plate responsive to said outward withdrawing force on the shackle, means for initially rocking said fence plate about said pivot from latching to unlatching position responsive to application of said initial inward force on the shackle when the locking means is in said unlocking position to withdraw the locking flange from the latching notch and shift said shouldered portion of the shouldered slot out of intercepting relation to said lug, said fence plate remaining in unlatching position during an initial portion of said outward shackle travel until the latching notch is disposed outwardly beyond the locking flange and said actuator plate having a cam surface formation for engaging the fence plate and returning it to said latching position during a second portion of outward shackle travel following said initial portion, the end of said shorter shackle leg and said locking flange being shaped for rocking the fence plate toward unlatching position to admit the shackle to said inner locking position during inward travel of the shackle, and spring means for returning the locking flange into locking relation in said latching notch when the shackle reaches said inner locking position following said inward travel.

3,952,560

PADLOCK WITH BUMPER

Lurk Ming Lee, Hong Kong, Hong Kong, Hong Kong, assignor to Po Wah Company, Hong Kong, Hong Kong

Filed Aug. 4, 1975, Ser. No. 601,472
Int. Cl.² E05B *67/02*
U.S. Cl. 70—52 **15 Claims**

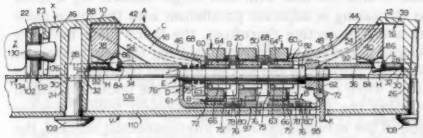


1. A padlock comprising a body, said body comprising a plurality of superimposed metal plates, a band of material softer than the metal of said plates, surrounding a group of said plates, one or more of the plates of said group being provided with one or more projections, and said band having perimetric upper and lower edges and being formed with recesses receiving said projections, to retain the band in place on said body.

3,952,561
COMBINATION LOCK IN A LUGGAGE CASE HANDLE STUD

Lazlo Bako, Woodcliff Lake, N.J., assignor to Presto Lock Company, Elmwood Park, N.J.

Filed Nov. 5, 1974, Ser. No. 521,042
Int. Cl.² E05B 65/52, 37/02
U.S. Cl. 70—70 11 Claims

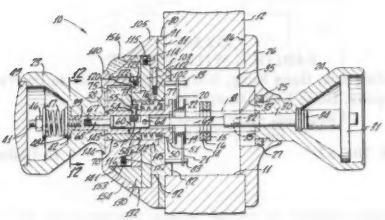


1. A combination lock cooperable with a hasp, the lock comprising a longitudinally movable puller having means for engaging the hasp and having a plurality of longitudinally spaced slots each receiving a rotatable dial, the dials being longitudinally movable with the puller, and a sleeve for each dial rotatable therewith, the dials and the sleeves having cooperable means permitting movement of a dial longitudinally relative to its associated sleeve, the sleeves being cooperable with means provided by the puller for blocking movement of the puller from latching position when the dials are off combination and for permitting movement of the puller between latching and unlatching positions when the dials are on combination.

3,952,562
COMBINED KNOB AND PERMUTATION LOCK ASSEMBLY FOR DOOR LATCHES

A. Ray Snow, 1327 S. 14th East, Salt Lake City, Utah 84105

Filed June 9, 1975, Ser. No. 585,313
Int. Cl.² E05B 13/10, 37/08
U.S. Cl. 70—146 19 Claims



15. A combination knob and permutation lock assembly adapted to be mounted in a door for controlling a door latch comprising:

coaxial external and internal knobs mounted for rotation on opposite sides of said door;

shaft means extending coaxially between said door knobs for rotation therewith, said shaft means engaging and activating said door latch upon rotation thereof by either of said knobs;

sleeve means mounted on said shaft means for axial movement only relative to said assembly as said shaft means is rotated by either said external or said internal knob, said sleeve means including a radially extending key;

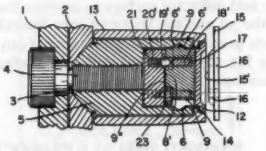
first and second coplanar locking rings mounted coaxially with said shaft means, said locking rings having first and second slot means therein, respectively, alignable with each other to define a continuous slot which is alignable with said sleeve means key, said locking rings preventing axial movement of said sleeve means and activation of said door latch except when both said first and second slot means are aligned with said sleeve means key; and

means mounted coaxially with and adjacent said external door knob and operatively connected to said first and second locking rings for independently moving said locking rings to align said first and second slot means with said sleeve means key so as to unlock said assembly.

3,952,563
LOCK ASSEMBLY

Saburo Yamashita, Takarazuka, Japan, assignor to Kyo-ei Industrial Corporation, Japan

Filed Aug. 12, 1974, Ser. No. 496,630
Claims priority, application Japan, Nov. 21, 1973, 48-131516
Int. Cl.² E05B 35/14, 47/00, 65/12; F16B 41/00
U.S. Cl. 70—232 7 Claims



1. A lock assembly having a locked state comprising, in combination:

a magnetic key;

a nut defining a cavity and a peripheral groove about said cavity;

a shell detachably mountable on said nut, said shell being rotatable substantially about said nut in said locked state, whereby access to said nut is substantially avoided;

a locking member adapted to be received by said cavity in said nut, said locking member and said shell cooperating to define engagement means for securing said shell about said nut in said locked state, said locking member including latch means for securing said locking member within said cavity, said latch means being operative in an extended state and a retracted state, bias means for normally biasing said latch means to said extended state and magnetic pin means for selectively locking said latch means in said extended state, said locking member and said latch means defining at least one pin receiving cavity and at least one pin slot, respectively, said pin receiving cavity and said pin slot substantially aligning whenever said latch means is in said extended state, said magnetic pin means being operable in said pin receiving cavity and said pin slot and responsive to said magnetic key, said latch means including at least one tip having inclined sides for engaging said groove in said locked state, said tip and said inclined sides cooperating to define means for overcoming said bias means whenever said latch means is urged against said nut.

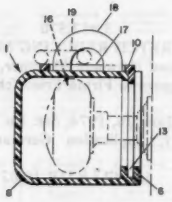
3,952,564
PROTECTIVE DEVICE FOR DOOR KNOBS AND THE LIKE

Peter Maines, 1350-20th St. A-24, Boulder, Colo. 80302

Filed May 28, 1975, Ser. No. 581,693
Int. Cl.² E05B 13/00
U.S. Cl. 70—416 3 Claims

1. A protective device for mounting on a lock operating member and the like comprising a generally rectangular casing including flat walls, a generally rectangular opening in the front wall thereof, a guide track being formed in the sides and bottom of said opening, a right-angularly disposed closure member having a downwardly depending slotted front plate

and a horizontally disposed top plate, said slotted plate being slidably disposed in said guide track to straddle said lock operating member when positioned within said casing, said top plate being slotted, and an apertured ear on the top wall



of said casing adapted to project through the slot in said top plate whereby a locking member is positionable therethrough to lock and retain said casing on said lock operating member and prevent access thereto and normal actuation thereof.

3,952,565

HARDENABLE LOCK

Morris Falk, Palm Springs, Calif., assignor to Fort Lock Corporation, River Grove, Ill.

Filed Oct. 17, 1974, Ser. No. 515,580
Int. Cl.² E05B *67/04*
U.S. Cl. 70—417 **6 Claims**

1. In a maximum security lock of the type having a monolithic lock body with a plurality of bores therein, hardened steel shackle means receivable in first and second bores, one leg of said shackle means being non-removable and the other being removable, a pair of shackle-fixing members within another bore in said lock body for preventing and for permitting opening of said shackle, and a key-receiving lock mechanism in an additional bore in said body which, when actuated by a proper key inserted in the lock mechanism, permits retraction of said shackle-fixing members and opening of the padlock, the improvement wherein said monolithic lock body is made of a compressed and sintered powdered metal alloy of an austenitic stainless steel containing about 16–26 weight percent chromium, about 8–22% nickel, and a maximum of 0.45% carbon and 2.0% manganese, whereby the resulting lock body is substantially softer than said shackle means, but, when an attempt is made to saw through said body, said stainless steel work-hardens to resist further sawing.

3,952,566

BEARING AND LUBRICANT FILM TEST METHOD AND APPARATUS

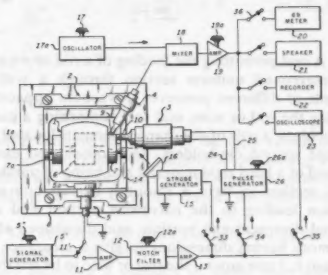
Peter E. Jacobson, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,948
Int. Cl.² G01N *29/00*
U.S. Cl. 73—10 **32 Claims**

29. The method of testing a rotary bearing supporting a rotor member for rotation about a spin axis, said rotary bearing comprising a stationary bearing race resiliently supported for motion in a direction normal to said spin axis, a rotatable bearing race on said rotor member, and a plurality of spaced ball elements between said bearing races, said rotary bearing being under normal assembled preload for said rotor member, said method consisting in:

rotating said rotor member about said spin axis at an arbitrary rotation frequency,

determining the angular position with respect to said spin axis of a selected ball element relative to said stationary bearing race,



applying a pulse of ultrasonic carrier energy to said stationary bearing race adjacent said selected ball element when at said angular position whereby said selected ball element in combination with said bearing races oscillates in response to said ultrasonic energy in a pattern characteristic of said combination, and

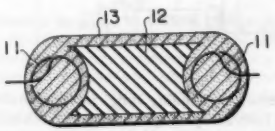
detecting a characteristic of said pattern for determining an operating condition of said rotary bearing.

3,952,567

GAS SENSOR

Kiminari Shinagawa, Hachioji; Sadao Hishiyama, Sayama; Shinichi Ito, Kokubunji; Kunifusa Kayama, Tokyo, and Satoshi Taniguchi, Tokorozawa, all of Japan, assignors to The Hitachi Heating Appliances Co., Ltd., Kashiwa, Japan

Filed June 13, 1975, Ser. No. 586,813
Claims priority, application Japan, June 14, 1974, 49-67125
Int. Cl.² G01N *27/04*
U.S. Cl. 73—23 **8 Claims**



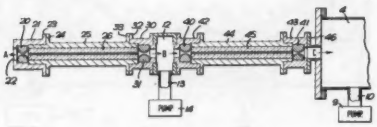
1. A gas sensor for detection and measurement of reducing gases, which comprises a spinel-type ferrite, means for maintaining said spinel-type ferrite at a desired temperature, and means for measuring the electric resistance of said spinel-type ferrite.

3,952,568

VACUUM PROCESSING OF ROD, WIRE OR STRIP MATERIAL

Joseph Brian Wareing, Chester, and Herbert Hall, Wakefield, both of England, assignors to The Electricity Council, London and Johnson & Nephew (Non-Ferrous), Manchester, both of, England

Filed Sept. 4, 1974, Ser. No. 503,193
Int. Cl.² B21D *37/16*; C23C *13/10*; F27D *1/00*
U.S. Cl. 72—38 7 Claims



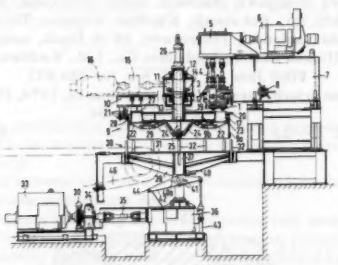
1. A seal permitting the feeding of a rod or wire material of predetermined uniform section through a wall separating regions at different pressures in vacuum apparatus for processing the rod or wire, said seal comprising a pair of spaced die-holders; a pair of die-shaped elements located one in each of said spaced die-holders, each die-shaped element being formed of a hard rigid material and being of parabolic form in axial section to have a smoothly-curved convergent entry portion leading to the narrowest portion and a smoothly-curved divergent exit portion, said die-shaped elements furthermore having dimensions to give a clearance of between 0.1 and 0.2 mm around the rod or wire to be fed therethrough; a tube sealed between said spaced die-holders; and a removable insert of non-abrasive material in said tube closely fitting within the tube, and having an opening extending therethrough for receiving the rod or wire to be fed through said seal.

3,952,569

METHOD AND APPARATUS FOR COILING LONG PRODUCTS

Gunter Lauterjung, Solingen, Germany, assignor to Firma Friedrich Kocks, Dusseldorf, Germany

Filed Sept. 11, 1974, Ser. No. 505,134
Claims priority, application Germany, Sept. 15, 1973, 2346554
Int. Cl.² B21C *47/00*
U.S. Cl. 72—134 13 Claims



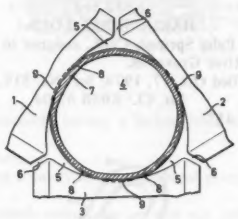
1. A method of winding long, rod-like material, such as tubes, into coils comprising the steps of continuously bending the material to be coiled, continuously depositing the bent material into a rotating coiler, collecting the bent material on the coiler until a preselected size coil has been accumulated, ejecting the completed coil downwardly from the continuously rotating coiler into a delivery recepticle rotating substantially in synchronism with the coiler, while maintaining the rotating speed of said coiler, reducing the speed of the delivery receptacle, removing the completed coil from the delivery receptacle, and reaccelerating the delivery receptacle to the speed of rotation of the coiler while feeding material for the next succeeding coil into the coiler during such speed reduction, coil removal and reacceleration.

3,952,570

STRETCH REDUCING MILLS

Werner Demny, and Hermann Moeltner, both of Dusseldorf, Germany, assignors to Firma Friedrich Kocks, Dusseldorf, Germany

Filed June 26, 1974, Ser. No. 483,371
Claims priority, application Germany, July 4, 1973, 2333916
Int. Cl.² B21B *19/02*
U.S. Cl. 72—224 5 Claims



1. A stretch reducing mill for tubes being rolled without mandrels, said mill having a number of successive motor driven roll stands which are arranged directly one behind the other with successively smaller sizing passes to a final finishing pass, each stand having three grooved rolls defining a said sizing pass and arranged at 120° to one another, in which at least the first sizing pass is defined by groove means of a non-circular curved configuration to effect the reduction of incoming tubes having a range of external diameters.

3,952,571

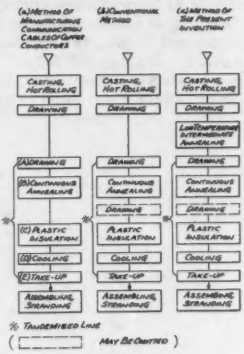
METHOD OF MANUFACTURING ALUMINUM CONDUCTOR WIRES

Minoru Yokota; Ken-Ichi Sato, both of Osaka, and Takenobu Higashimoto, Yokohama, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 30, 1975, Ser. No. 545,693
Claims priority, application Japan, Feb. 12, 1974, 49-17334
Int. Cl.² B21C *9/00*
U.S. Cl. 72—286 2 Claims

1. A method of manufacturing aluminum wires for communication cables, insulated electric wires and the like from an initial work material of aluminum for electrical purposes or an aluminum alloy for electrical conductors containing various additive elements, comprising the steps of hot working the initial work material, then cold working the material 80% or

more, then applying a low temperature intermediate annealing treatment to the material at 100°C to 280°C, then further cold



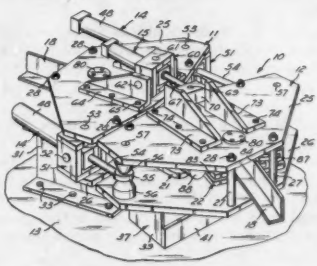
drawing the material 50% or more, and then continuously annealing the worked material.

3,952,572

BEAM BENDER

Harry W. Mergler, Westlake; Daniel K. Wright, Cleveland Heights; Thomas P. Kicher, South Euclid; Michael Savage, Cleveland, and Wieslaw Kosc, Parma, all of Ohio, assignors to Case Western Reserve University, Cleveland, Ohio

Filed Jan. 23, 1974, Ser. No. 435,713
Int. Cl.² B21D *11/04, 7/03*
U.S. Cl. 72—298 **16 Claims**



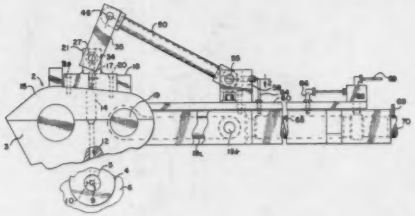
1. A method of bending a beam comprising the steps of providing a beam having a nonsymmetrical cross section with respect to a first axial plane, laterally engaging the beam at two spaced points with surfaces provided on a pair of longitudinally spaced bending heads, applying a force couple on one of the heads, with sufficient magnitude to cause rotation of the one head relative to the other, in a longitudinal plane oriented from said first axial plane and a second axial plane perpendicular to said first axial plane and having an orientation determined by the cross section of the beam whereby a permanent deflection of the beam is produced solely in said first axial plane.

3,952,573

ARTICULATED AIR LEAD-IN LINKAGE FOR CAN BODY MAKER

Roy E. Sorensen, Lombard, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Apr. 21, 1975, Ser. No. 569,911
Int. Cl.² B21D *22/20*
U.S. Cl. 72—342 **11 Claims**



1. In a metal forming apparatus of the type comprising a main frame and a longitudinally reciprocal ram having an air passage leading to a can forming use area, and heat generative means mounting the ram from the frame, the improvement comprising:

A linkage for delivering air from a supply source through the air passage in the ram to said use area,

said linkage including a plurality of metal links with air passages therein, means pivotally interconnecting said links and having air passages providing communication between the passages in the links,

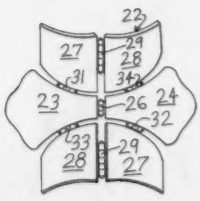
and connection means in thermal conductivity with said linkage and said heat generative means providing a heat sink therefor.

3,952,574

PROCESS AND APPARATUS FOR FORMING SHEET METAL STRUCTURES

John A. Speidel, 7205 Kings Mills Road, Maineville, Ohio 45039

Filed Oct. 31, 1974, Ser. No. 519,430
Int. Cl.² B21D *11/20*
U.S. Cl. 72—379 **4 Claims**



1. The process of forming, by folding, a sheet metal structure which is developable without slitting, by folding a sheet of metal without stretching, crumpling or tearing said sheet which structure has at least two adjacent surface segments which collectively form a complex surface and is further characterized in that straight bend lines meet at a curved bend line upon the complex surface and the images of those straight bend lines when projected on the developed pattern of said structure meet upon the projected image of the curved bend line upon the developed pattern, comprising:

a. commencing the folding of said metal along selected curved bend lines, and

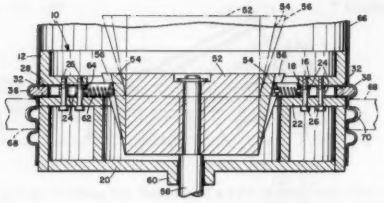
b. simultaneously folding the metal along said straight bend lines and along said curved bend lines.

3,952,575

BELLOWS FORMING APPARATUS

George T. Straza, and Edward L. Parr, both of El Cajon, Calif., assignors to Straza Enterprises Ltd., El Cajon, Calif.

Filed Jan. 30, 1975, Ser. No. 545,337
Int. Cl.² B21D 41/02
U.S. Cl. 72—393 4 Claims



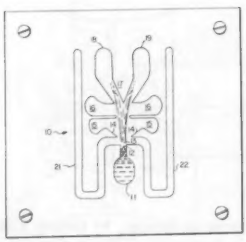
1. Bellows forming apparatus, comprising:
a rigid cylindrical sleeve for supporting, with a close axial sliding fit, a tube to be formed into a bellows,
said sleeve having a radially opening circumferential channel,
a mandrel composed of alternate primary and secondary sections radially slidably mounted in said channel,
actuating means for moving said mandrel sections between a retracted position within the channel and an expanded position extending circumferentially from the channel,
said primary and secondary sections interfitting and having edge portions which form, in the expanded position, an unbroken peripheral ring conforming to the inner contour of a bellows corrugation to be formed in the tube.

3,952,576

LAMINAR JET FLUID PROPERTY SENSOR

Tadeusz M. Drzewiecki, Silver Spring, and Francis M. Manion, Rockville, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1975, Ser. No. 566,900
Int. Cl.² G01N 11/00
U.S. Cl. 73—54 4 Claims



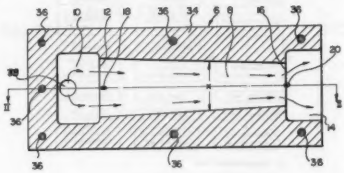
1. A laminar fluidic device for sensing fluid properties that affect viscosity, said device comprising: a source of supply for directing a jet of fluid outwardly from a nozzle; a pair of control channel means disposed on opposite sides of said jet of fluid for deflecting said jet in response to a difference in the resistence of one control channel means with respect to the other control channel means, said resistence difference effecting a pressure differential across said jet; a pair of output chanels for receiving said jet of fluid in accordance with the deflection thereof; vent means disposed between said nozzle and said output channels; and wherein each said control channel means normally exhibits a channel resistence equal to the jet edge resistence.

3,952,577

APPARATUS FOR MEASURING THE FLOW RATE AND/OR VISCOUS CHARACTERISTICS OF FLUIDS

William F. Hayes; John W. Tanney, both of Ottawa, and Helen G. Tucker, Orleans, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 6, 1975, Ser. No. 547,607
Claims priority, application Canada, Mar. 22, 1974, 195776
Int. Cl.² G01F 1/46, 1/48; G01N 11/08
U.S. Cl. 73—55 38 Claims



1. Apparatus for measuring the flow rate and/or the viscous characteristics of a fluid, comprising:
a. a casing having a fluid passage, a fluid inlet cavity for connection to a source of pressurized fluid and forming a substantially unobstructed flow path for fluid to the whole area of an inlet end of the fluid passage, normal to the direction for flow of fluid in the fluid passage, and a fluid outlet cavity for the escape of fluid from the casing and forming a substantially unobstructed flow path for fluid from substantially the whole area of an outlet end of the fluid passage, normal to the direction for flow of fluid in the fluid passage,
b. fluid pressure detecting means in the casing for detecting a fluid pressure differential between spaced positions in the fluid passage in the direction for flow of fluid therein, and
c. fluid pressure indicating means, connected to the fluid pressure detecting means, from which the fluid pressure differential in the fluid passage can be deduced, and wherein,
d. the ratio of the mean breadth to the mean width of the fluid passare area, normal to the direction for flow of fluid therein, is at least ten to one for at least the portion of the fluid passage which extends between the said spaced positions,
e. the area of the fluid passage, normal to the direction for flow of fluid in the fluid passage, and for at least the portion of the fluid passage which extends between the said spaced positions, continuously reduces in size in the direction for flow of the fluid such that laminar flow will be maintained of the fluid flowing in the passage, and such that when using substantially pure water at 70°F as a standard,
i. the static pressure differential at said spaced locations is dependant upon the mass flow rate G of the substantially pure water through the fluid passage and satisfies the relationship in consistent units:

$$\Delta p = K_1 (G)^2 + K_2 (G), \text{ and}$$

ii. the total pressure differential at said spaced locations is linearily dependant upon the mass flow rate G of the substantially pure water in the fluid passage, and
the above pressure differential relationships for static and total pressure differential (Δp and ΔP respectively) are over a range of flow rates for the substantially pure water for which the difference between the maximum Reynolds numbers in the fluid passage between the said spaced

positions therein is within the range 0 and 8000, where the Reynolds number R_e is defined, in consistent units, by:

$R_e = h\rho U/\mu$,

where

h = the mean width of the fluid passage at the position between the said spaced positions for which the Reynolds number is a maximum,

ρ = the fluid density of the substantially pure water,

U = the means velocity of the substantially pure water at the position between the said spaced positions for which the Reynolds number is a maximum, and

μ = the absolute viscosity of the substantially pure water, and where in the case of static pressure differential the ratio K_1/K_2 is greater than 0.01, where K_1 and K_2 are constants for a given fluid passage geometry and are determined from the relationships:

$$K_2 = \frac{\Delta P_1 - \Delta P_2 \left(\frac{G_1}{G_2}\right)^2}{G_1 - \left(\frac{G_1}{G_2}\right)^2},$$

and

$$K_1 = \frac{\Delta P_1 - K_2 (G_1)}{(G_1)^2} = \frac{\Delta P_2 - K_2 (G_2)}{(G_2)^2},$$

where

Δp_1 = static pressure differential between the said spaced positions when the maximum Reynolds number in the fluid passage between the said spaced positions is 8000,

G_1 = the fluid mass flow rate of the substantially pure water through the fluid passage when the maximum Reynolds number in the fluid passage between the said spaced positions is 8000,

Δp_2 = static pressure differential between the said spaced positions when the maximum Reynolds number in the fluid passage between the said spaced positions is 3500,

G_2 = the fluid mass flow rate of the substantially pure water through the fluid passage when the maximum Reynolds number in the fluid passage between the said spaced positions is 3500, so that

f. the fluid characteristic to be measured is related to the pressure differential, indicated by the fluid pressure differential indicating means, and is deducible therefrom in a consistent manner for different fluids.

3,952,578
SCANNING ULTRASONIC SPECTROGRAPH FOR FLUID ANALYSIS

John E. Jacobs, Evanston, Ill., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

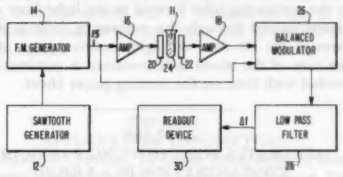
Filed Oct. 7, 1974, Ser. No. 512,622
Int. Cl.² G01N *33/16*
U.S. Cl. 73—64.1 **4 Claims**

1. A scanning acoustic spectrographic analyser for time delay acoustic spectrography in investigating the changes in fluid properties undergone by a fluid in a short period of time comprising:

signal generating means for generating a frequency modulated first electrical signal having a periodic linear increase in frequency;

first transducer means for converting said frequency modulated first electrical signal into an acoustic wave signal and transmitting said acoustic wave signal through the fluid to be analyzed, wherein said first transducer means transmits but does not receive acoustical signals;

second transducer means for receiving said acoustic wave signal transmitted through the fluid and coverting said received acoustic wave signal to a second electrical signal, wherein said second transducer means receives, but does not transmit acoustical signals;



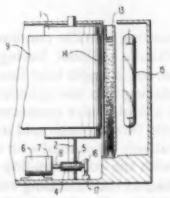
comparing means, having as first and second inputs said first and second electrical signals, for comparing said first and second electrical signals and generating an output signal dependent upon the difference in frequency between said first and second electrical signals;

display means for displaying said output signal in visual form.

3,952,579
AUTOMATIC BLOOD SEDIMENTATION RATE MEASURING DEVICE

Hiroyuki Nakajima, Ashiya, Japan, assignor to Konan Electric Co., Ltd., Nishinomiya, Japan

Filed July 1, 1974, Ser. No. 484,499
Claims priority, application Japan, June 30, 1973, 48-74215
Int. Cl.² G01N *15/04*
U.S. Cl. 73—61.4 **13 Claims**



1. An automatic blood sedimentation rate measuring device for photographic recording the blood sedimentation rate on individual, light-sensitive paper sheets, said device comprising:

a light-proof casing,

a cylindrical drum,

means for mounting said cylindrical drum for rotation within said light-proof casing about a vertical axis,

said light-proof casing including a curved wall portion conforming to a portion of the periphery of said drum and being spaced slightly therefrom to define a narrow gap for receiving said light-sensitive paper sheet during rotation of said drum,

an elongated blood sedimentation measuring tube mounted within said casing and extending vertically parallel to the axis of said drum,

said light-proof casing including means defining a light barrier between said tube and said paper sheet,

a vertical slit within said barrier and parallel to the axis of said tube,

a lamp provided on the side of the blood sedimentation measuring tube opposite said slit,

motor means for moving said drum to cause light-sensitive paper sheet to move with the drum periphery across said slit,

means for pressing said paper sheet to said drum periphery during drum rotation,

switch means for controlling energization of said lamp, and

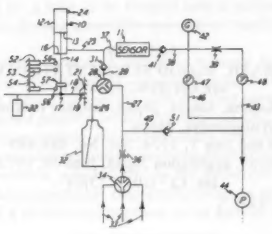
means driven by said motor means for periodically operating said switch means to synchronize lamp energization and production of light pulses with drum movement;

whereby, the shade of the sedimented red blood corpuscles in the measuring tube formed as the light from the lamp means passes through the measuring tube is projected through the slit onto the light-sensitive paper sheet and the rate of the blood sedimentation is automatically recorded with time on the moving paper sheet.

3,952,580
APPARATUS FOR COUNTING PARTICLE CONTAMINATION IN A LIQUID

Milton C. Bennett, Moline, Ill., assignor to J. I. Case Company, Racine, Wis.

Filed June 19, 1975, Ser. No. 588,406
Int. Cl.² G01N *15/00*
U.S. Cl. 73—61.4 **9 Claims**



1. Apparatus for counting particle contamination in a liquid, comprising a hydraulic cylinder having a liquid outlet opening in one end thereof, a liquid inlet line connected with said cylinder for introducing into said cylinder a charge of the liquid to be examined, a liquid valve connected with said inlet line for controlling liquid flow through said inlet line, a piston and rod assembly operatively associated with said cylinder and movable therein and with the rod extending from said cylinder, mechanism attached to the extending end of said rod for applying a uniform force on the piston in the axial direction of said cylinder and from the other end thereof and toward said outlet opening for forcing liquid from said cylinder and out said outlet opening, a particle counter sensor, a liquid flow line connected between said cylinder outlet opening and said sensor for directing liquid from said cylinder to said sensor, and a liquid flow restrictor connected with said sensor and downstream therefrom for establishing a pressure in the liquid flowing from said cylinder and through said sensor, to thereby establish a liquid pressure and flow rate through said sensor to enable said sensor to count contamination particles in the liquid flowing therethrough.

3,952,581
ULTRASONIC FLAW DETECTING APPARATUS FOR TURBINE ROTORS

Herbert R. Gottelt, Mount Prospect, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Nov. 29, 1974, Ser. No. 528,586
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **9 Claims**

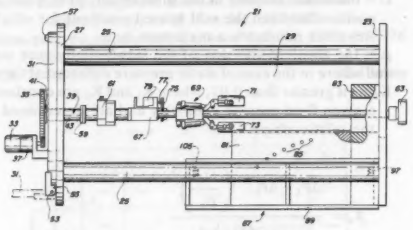
1. An ultrasonic flaw detecting arrangement for rotor bores comprising:

a primary mounting plate secured to the rotor and having a central opening therein permitting access to the bore of the rotor;

a motor mounting plate spaced from said primary mounting plate;

supporting means extending between said mounting plates to rigidly support said motor mounting plate on said primary mounting plate in a cantilever fashion;

a chamber defined by said mounting plates and said supporting means, said supporting means being a plurality of



spaced extending members so that said chamber is accessible to an operator;

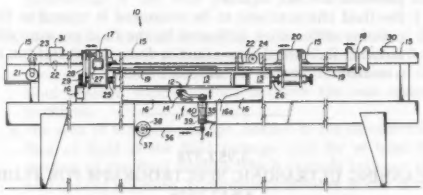
an ultrasonic test unit insertable into the bore of the rotor, said test unit being positionable in said chamber for inspection and servicing while said primary mounting plate remains secured to the rotor; and

a motor mounted on said motor mounting plate to actuate a drive shaft for said test unit.

3,952,582
ULTRASONIC INSPECTION DEVICE AND SYSTEM

Joe D. Graham, Poway; Kenneth W. Mead, and Henry Edgar Babb, both of El Cajon, all of Calif., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Mar. 7, 1975, Ser. No. 556,422
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **7 Claims**

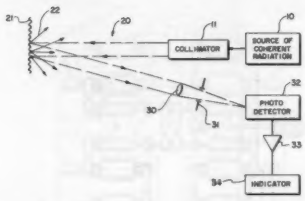


1. An apparatus for ultrasonically inspecting a part, comprising an ultrasonic head assembly including a transducer, a plurality of relatively large bearing bodies rotatably mounted in and projecting from the surface of said head assembly, a plurality of arrays of relatively small bearing bodies one for each of said large bearing bodies and rotatably supporting the same, means for selectively adjusting the distance and inclination between said transducer and said large bearing bodies to a predetermined relationship, means for supporting and resiliently biasing said ultrasonic head assembly for placing said large bearing bodies into engagement with the surface of said part, means for maintaining a substantially continuous column of water between said transducer and the surface of said part, and means for displacing said part and said ultrasonic head assembly relative to each other.

3,952,583
APPARATUS AND METHOD FOR THE REMOTE DETECTION OF VIBRATIONS OF DIFFUSE SURFACES

Vincent J. Rosati, Oakhurst, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 2, 1975, Ser. No. 538,050
Int. Cl.² G01H 9/00
U.S. Cl. 73—71.3 14 Claims



1. Apparatus for the remote detection of vibrations of a diffuse surface having randomly distributed points comprising:

means for providing a source of coherent radiation;

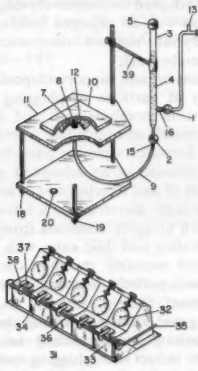
means for projecting a beam of said coherent radiation onto said diffuse surface; and

means, separate and independent of said source, for detecting a reflected time-varying intensity distribution resulting from a scattering of the photons of said beam of coherent radiation by said randomly distributed points on said surface as said surface vibrates and producing corresponding electrical signals.

3,952,584
MEASUREMENT OF ABSORBENCY CHARACTERISTICS OF ABSORBENT STRUCTURES

Bernard M. Lichstein, 887 Colonia Road, Elizabeth, N.J. 07208

Filed Mar. 4, 1975, Ser. No. 555,101
Int. Cl.² G01N 13/00
U.S. Cl. 73—73 11 Claims

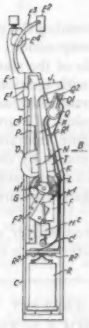


1. A device for measuring the characteristics of materials for absorbing a liquid comprising: a liquid reservoir having an opening at its bottom and a closed air tight top; an orifice plate having a liquid delivery orifice therethrough and said liquid delivery orifice in fluid tight flow communication with said opening in said reservoir through flow communication means; an air bleed orifice in said liquid reservoir intermediate between the top and bottom thereof and in fluid communication with the atmosphere; and means for adjusting the relative heights of the air bleed orifice to the orifice plate whereby when the liquid is introduced into said liquid reservoir and fills the flow communication means, the relative height of the orifice plate to the air bleed orifice may be adjusted so that there is no fluid driving force acting to cause liquid to flow through said liquid delivery orifice and when said absorbent material is placed over said liquid delivery orifice in contact with said liquid and said liquid is drawn into said absorbent material, the fluid system will be balanced so that in the absence of said absorbent material there will be no flow through said orifice plate.

3,952,585
APPLANATION TONOMETERS

Edward Sylvester Perkins, 16 Loom Lane, Radlett, Hertford, and Henry James Stockwell, Cymru, Epping Road, Roydon, Essex, both of England

Filed June 30, 1971, Ser. No. 158,508
Claims priority, application United Kingdom, July 1, 1970, 32010/70
Int. Cl.² A61B 3/16
U.S. Cl. 73—80 4 Claims



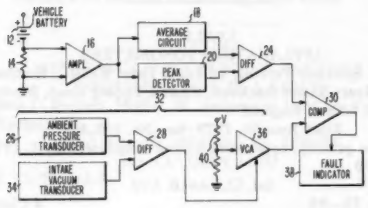
1. An applanation tonometer for measuring the intraocular pressure of a patient's eye by applying an applanating pressure to the cornea and measuring the amount of pressure needed to produce a flattened area of predetermined size thereon, comprising an applanating member for engaging with the cornea, a lever arm carrying such member, and mounted to pivot about an axis, a pivot member which is mounted on such axis and from which the lever arm extends, means for applying a turning force to such pivot member for causing pressure to be exerted on the cornea, such force applying means including an adjustable main spiral spring surrounding the said axis, control means for effecting adjustment of the main spring, means for anchoring the inner end of the main spring to the pivot member, and an anchorage member for the outer end of the main spring mounted for rotational movement about the said axis in accordance with the operation of the control means, such rotational movement causing rotation of the pivot member and thereby causing the applanating pressure to be applied to the cornea, an indicating member actuated by the control means for giving an indication of the applanating pressure applied to the cornea, and at least one compensating spiral spring surrounding the said axis, means for anchoring the inner end of the compensating spring to the pivot member and means for anchoring the outer end of the compensating spring to the casing of the tonometer, the characteristics of the compensating spring being such in relation to those of the main spring that the total applanating pressure will bear an approximately linear relationship to the movement of the indicating member.

3,952,586

DETERMINING ENGINE COMPRESSION FROM STARTER MOTOR CURRENT

Richard Eric Hanson, Winchester, and Thomas Edward Nolan, Jr., Medfield, both of Mass., assignors to RCA Corporation, New York, N.Y.

Filed June 19, 1975, Ser. No. 588,386
Int. Cl.² G01M 15/00
U.S. Cl. 73—117.2 10 Claims



6. The method of determining the mechanical conditions in an engine which affect compression, comprising the steps of

measuring the amplitude of the starter motor current when cranking the engine with ignition inhibited,

measuring the intake manifold absolute pressure,

multiplying a known value of starter motor current when cranking a good engine operating with a given intake manifold absolute pressure by the ratio of said measured intake manifold absolute pressure divided by said given intake manifold absolute pressure, to provide an adjusted value, and

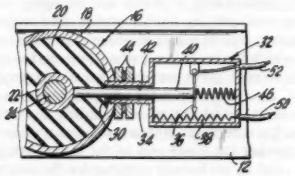
comparing said measured starter motor current with said adjusted value of starter motor current.

3,952,587

VEHICLE TORQUE SENSING DEVICE

Richard Goodhart, 528 Atlanta Ave., Massapequa, N.Y. 11758

Filed Sept. 24, 1974, Ser. No. 508,820
Int. Cl.² G01L 5/13
U.S. Cl. 73—136 R 5 Claims



1. A device for determining potential skid conditions of a moving vehicle, comprising in combination,

a. a resilient bushing yieldably connecting the driven axle of the vehicle to the vehicle frame, said bushing having a rubber insert and a steel outer shell; sensing means responsive to distortions of said rubber insert effected by pressure changes betwen said axle and said frame, said sensing means including a housing fixed relative to said outer shell and a relatively movable member; and

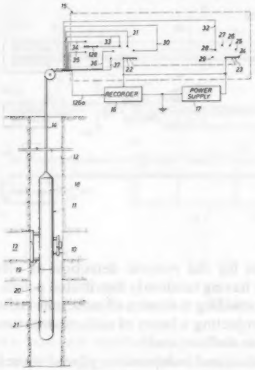
b. indicating means connected to said sensing means to visually indicate the relative pressure changes during acceleration or deceleration of the vehicle.

3,952,588

APPARATUS FOR TESTING EARTH FORMATIONS

Frank R. Whitten, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,086
Int. Cl.² E21B 47/10
U.S. Cl. 73—155 25 Claims



1. Formation-testing apparatus adapted for testing earth formations penetrated by a borehole and comprising:

a support;

fluid-admitting means on said support defining a fluid entry adapted for engagement with a borehole wall, fluid passage means in said fluid-admitting means, and filtering means cooperatively intercommunicating said fluid entry and said fluid passage means and adapted to retain inflowing loose formation particles as connate fluids from earth formations therebeyond pass through said filtering means into said fluid passage means;

means on said support adapted for selectively engaging said fluid-admitting means with an adjacent borehole wall to place said fluid entry into isolated communication with earth formations therebeyond;

particle-collecting means on said support adapted for clearing said fluid entry of particles of plugging materials situated on an adjacent borehole wall and in isolated communication therewith and including a first movable member defining a forwardly-opening particle-receiving chamber normally situated at an advanced position in said fluid entry ahead of said filtering means and adapted for movement rearwardly therefrom to a retracted position for carrying such plugging materials from said fluid entry and communicating said fluid entry with said filtering means, a second movable member cooperatively arranged within said particle-receiving chamber and adapted for movement therein between an advanced position for blocking said particle-receiving chamber and an intermediate position for expanding said particle-receiving chamber to induct such plugging materials into said particle-receiving chamber ahead of said second member, and means cooperatively arranged on said first and second movable members and adapted for moving said first movable member toward its said retracted position as said second movable member is moved further beyond its said intermediate position toward a more-retracted position; and

selectively-operable actuating means on said support cooperatively arranged for repetitively moving said first and second movable members back and forth between their respective said positions.

3,952,589

APPARATUS FOR TESTING A WHEELED VEHICLE

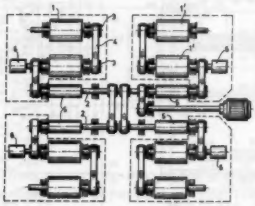
Herman Robert Geul, Leiden, Netherlands, assignor to Sun Electric Corporation, Chicago, Ill.

Filed Dec. 18, 1974, Ser. No. 534,152

Claims priority, application Netherlands, Dec. 20, 1973, 7317442

Int. Cl.² G01L 5/28

U.S. Cl. 73—117 5 Claims



1. Apparatus for testing a wheeled vehicle, comprising a plurality of wheel supporting units, each adapted to support a respective wheel of a vehicle and each including at least one wheel supporting roller, the wheel supporting units each being coupled to a transmission system via a respective torque meausuring device, said wheel supporting units and said transmission system being so constructed that all said wheel supporting rollers are constrained to rotate with the same peripheral speed as each other, and each said wheel supporting unit having a respective means for measuring the angular acceleration or deceleration of at least said one wheel supporting roller of the unit.

3,952,590

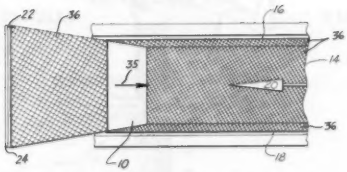
APPARATUS FOR REDUCING AERODYNAMIC NOISE IN A WIND TUNNEL

Paul W. Howard, and Luke A. Schutzenhofer, both of Huntsville, Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 26, 1975, Ser. No. 607,969

Int. Cl.² G01M 9/00

U.S. Cl. 73—147 4 Claims



1. In a fluid duct apparatus for aerodynamic testing and the like having a passage portion of substantially constant cross section, means for conveying a mass of air through said passage portion at least substantially at sonic speeds, said passage portion comprising:

a. a wall member enclosing and defining said passage portion therethrough having perforations formed therein providing porosity to said wall member;

b. a mesh screen member carried on an interior surface of said wall member covering said perforations for reducing background noise produced by the air flow passing over the edges of said perforations;

whereby interference of the background noise with the aerodynamic measurements taken within said passage portion is minimized increasing the accuracy and reliability of the measurements.

3,952,591

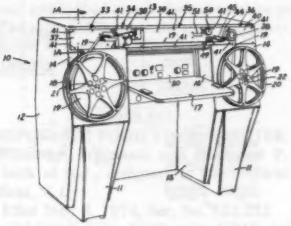
MACHINE FOR CLEANING AND INSPECTING MOTION PICTURE FILMS

Warren C. Manske; Robert Bretl, and Donald Dupont, all of Menominee, Mich., assignors to Bay Electric Company, Menominee, Mich.

Filed Aug. 15, 1974, Ser. No. 497,658

Int. Cl.² G01B 5/16; G01D 11/30

U.S. Cl. 73—157 17 Claims



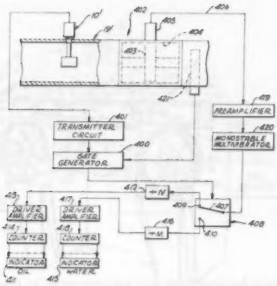
1. In a machine which is capable of cleaning motion picture films and inspecting motion picture films with respect to splices, tears or breaks, sprocket hole elongations, or the like, including a supporting frame having a front face portion, a rewind motor assembly carried by the supporting frame having a rewind spindle for removably receiving a rewind reel at the front face portion of the supporting frame containing a motion picture film to be cleaned and/or inspected and/or a motion picture film to be rewound thereon, a take up motor assembly carried by the supporting frame, spaced from the rewind motor assembly, having a take up spindle for removably receiving a take up reel at the front face portion of the supporting frame to receive and wind thereon a motion picture film which has been cleaned and/or inspected, said motion picture film extending along the front face portion of the supporting frame between said rewind reel and said take up reel, motor control means for controlling said take up motor assembly and said rewind motor assembly, the improvement in said combination wherein said supporting frame has module receiving means selectively to receive separate modules along the motion picture film between said rewind reel and said take up reel and including an opening in the front face portion of the supporting frame and adjacent securing means, one of said modules comprising a motion picture film cleaning module having a panel removably securable to the securing means of the module receiving means of the supporting frame and cleaning means carried by the panel extending rearwardly therefrom into the opening of the module securing means and forwardly therefrom for cleaning both sides of the motion picture film as it passes thereby, another of said modules comprising a motion picture film inspecting module having a panel removably securable to the securing means of the module receiving means of the supporting frame and detecting means carried by the panel extending rearwardly therefrom into the opening of the module receiving means and forwardly therefrom for inspecting the motion picture film as it passes thereby with respect to splices, tears or breaks, sprocket hole elongation, or the like, said motion picture inspecting module being selectively coupled to said motor control means to stop said take up motor assembly and rewind motor assembly in the event of improper splices, tears or breaks, sprocket hole elongation, or the like in the motion picture film as it passes the motion picture film inspecting module.

3,952,592

FLUID SENSING SYSTEMS

Gerald Lance Schlatter, and Charles Eveleigh Miller, both of Boulder, Colo., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Division of Ser. No. 187,948, Oct. 12, 1971. This application Nov. 24, 1972, Ser. No. 309,250
Int. Cl.² G01F 1/115
U.S. Cl. 73—194 R 13 Claims



1. A fluid flow sensing system, said system comprising: a flowmeter having an output lead and a first device for producing a train of pulses thereon of a pulse repetition frequency directly proportional to the volume rate of flow of a fluid through said flowmeter; a densitometer having an output lead and a second device for producing a signal thereon directly proportional to the specific gravity of said fluid; a first switch connected from said flowmeter output, said first switch having a switch position control lead; a first digital pulse counter connected from said first switch; and a gate generator connected from said densitometer output lead to said first switch, said gate generator producing an output pulse having a time width which is a predetermined percent of the period thereof, said predetermined percent being the percent of one of at least two different parts of said fluid, said first switch having first and second positions, said gate generator being adapted to hold said first switch in said first position during the generation of each output pulse of said gate generator and to hold said first switch in said second position thereof at all other times during normal operation, said first switch connecting said flowmeter output lead to the input of said first counter when said first switch is in one of said first and second positions and to disconnect said flowmeter output lead from said first counter all the normal operating time that said first switch is in the other of said first and second positions.

3,952,593

LIQUID LEVEL GAUGE

Edward G. Ells, Norwich, N.Y., assignor to Liquidometer Corporation, Norwich, N.Y.

Filed Aug. 1, 1974, Ser. No. 493,565
Int. Cl.² G01R 27/26
U.S. Cl. 73—304 C 15 Claims

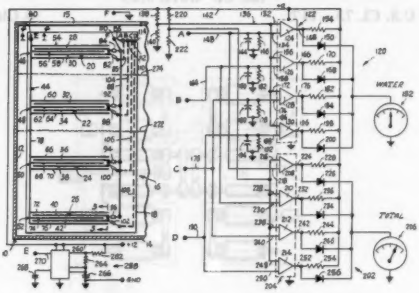
1. A liquid indicator device for gauging relative proportions of two immiscible liquids of different density disposed one above the other in a storage tank, comprising in combination:

a. a source of electrical signals,

b. an upright, electrically conducting probe part immersed in the liquids being gauged and passing through the interface formed therebetween, said probe part being connected with the source to receive signals therefrom,

c. A second probe part cooperable with the first part, said second part comprising an upright row of electrodes insulated from each other and immersed in said liquids in proximity to the first-mentioned probe part,

d. first detector means responsive to signals from said source and connected with said second probe part for designating which of the electrodes of said upright row are submerged in one of said liquids, and



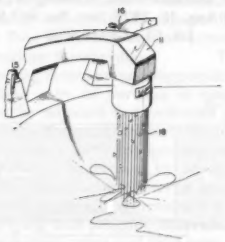
e. additional detector means operative substantially at the same time as said first detector means, responsive to signals from said source and connected with said second probe part for designating which of the electrodes of said upright row are submerged by either of said liquids.

3,952,594

TEMPERATURE REGISTERING FAUCET ATTACHMENT

W. Glenn McMahan, Broomfield, Colo., assignor to The Raymond Lee Organization,. Inc., New York, N.Y., a part interest

Filed Feb. 11, 1975, Ser. No. 549,005
Int. Cl.² G01K 13/02, 1/08, 1/14, 5/48
U.S. Cl. 73—349 1 Claim



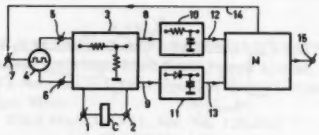
1. A gauge device adaptable for permanent attachment to the end of a spout of a sink which is fitted with means to indicate the temperature of water pouring out of said spout and through said device, in the form of

a tube open fitted at each end with a screw thread at one end for attachment to a mating screw thread at the end of the spout, with the interior of said tube fitted with a movable indicator needle responsive in position to the temperature of water passing through and out of the tube, together with a fixed transparent section of tube wall positioned so as to make the position of the indicator visible to the exterior of the device, said fixed section marked with a temperature scale.

3,952,595
TEMPERATURE CORRECTING CIRCUIT

Petrus Jacobus Poolman, and Frans Meijer, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,457
Claims priority, application Netherlands, Sept. 4, 1973, 7312147
Int. Cl.² G01K *1/20, 7/02*
U.S. Cl. 73—359 **12 Claims**

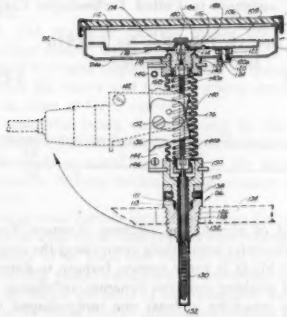


1. A temperature correcting circuit for a transducer element having a temperature-dependent internal resistance and which, in a temperature-dependent manner, converts a physical quantity to be measured into an EMF which can be derived as a measuring voltage from the terminals of the element comprising a source of alternating voltage, means connecting the element in a voltage-dividing network which is connected to said alternating-voltage source so that an alternating current flows through the element to derive an alternating voltage which, owing to the internal resistance of the element, contains information about the temperature of the element, a low-pass filter which allows only the measuring voltage to pass, an alternating-voltage amplitude detector which includes a smoothing filter, means connecting said low-pass filter and said amplitude detector to the output terminals of the voltage dividing network, and means for processing the output voltage from the low-pass filter to produce an output voltage at the output terminals of the circuit which is a function of the physical quantity and is corrected for the temperature-dependent conversion, at least for a given temperature operating range.

3,952,596
UNIVERSAL MOUNTING FOR BI-METALLIC THERMOMETER

Jagdish Patel, Cincinnati, Ohio, assignor to Palmer Instruments, Inc., Cincinnati, Ohio

Filed Dec. 17, 1974, Ser. No. 533,667
Int. Cl.² G01K *5/64*
U.S. Cl. 73—363.9 **6 Claims**

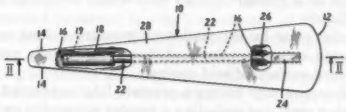


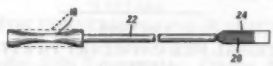
1. In a bi-metallic thermometer of the type having an enclosure consisting of a stem terminating in a case, a bi-metal helical temperature sensing coil disposed within said stem, a shaft extending from said coil into said case, said bi-metal helical temperature coil imparting rotory motion to said shaft, and a pointer secured to said shaft and cooperating with a calibrated scale to provide a direct indication of the temperature effecting said bi-metal coil, the improvement, in combination therewith, comprising a case connector secured to the underside of said case, said case connector having an aperture therein for receiving said shaft, a stem connector at the uppermost end of said stem, said stem and stem connector providing a separate socket or well, said case connector being telescopingly received within said stem connector, said case connector being rotatably adjustable in said stem connector, resilient sealing means exterior of said case connector to engage the interior of said stem connector, and means in association with said stem connector and case connector only to lock said case connector in any desired rotative position, whereby said case connector, and thus said case, pointer, shaft and bi-metal coil, may be rotated and locked in any desired rotative position for easy reading of said calibrated scale, or if necessary, removed from or replaced in said stem connector.

3,952,597
DISPOSABLE FOOD THERMOMETER

Robert J. Witonsky, Princeton, and Raymond P. Larsson, Danville, both of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Filed Nov. 8, 1974, Ser. No. 522,222
Int. Cl.² G01K *5/32;* **B29B** *3/00;* **G01K** *1/14*
U.S. Cl. 73—371 **14 Claims**





1. A disposable thermometer for use in a foodstuff to indicate the degree of cooking to which said foodstuff has been subjected comprising

a reservoir having a volumetric capacity of predetermined value at ambient temperatures,

a fluid filling said reservoir,

capillary means, and

indicator means,

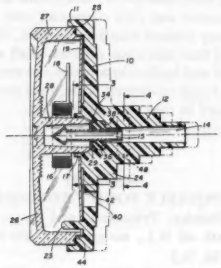
said capillary tube means communicating at one end with said reservoir and at the other end with said indicator means,

said reservoir being characterized by being of a material having the property of undergoing shrinkage when heated from an ambient temperature to temperatures associated with the cooking of foodstuffs whereby the volumetric capacity of said reservoir is caused to reduce from said predetermined value to a lesser volumetric capacity, reduction of the volumetric capacity of said reservoir being effective to expel fluid from said reservoir thru said capillary tube and onto said indicator means.

3,952,598
PRESSURE GAUGE CONSTRUCTION

Walter James Ferguson, Middlebury, and Ronald Joseph Luich, Shelton, both of Conn., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed July 28, 1975, Ser. No. 599,507
Int. Cl.² G01L 7/04
U.S. Cl. 73—415 10 Claims



1. A pressure gauge comprising:
a. a casing having a hollow stem for mounting into a receptacle of a pressure source with which the gauge is to be utilized;
b. a dial plate having graduated pressure indicia and supported secured against rotation on a radially extending inward surface of said casing;
c. a Bourdon tube having a pressure inlet supported in said casing stem and including a pointer supported on its free end opposite the indicia on said dial plate; and
d. a viewing crystal cooperating with said casing to enclose said pointer and dial plate in visible relation therethrough, said crystal including means operably defining an initial position of said pointer relative to the indicia on said dial plate.

3,952,599
FRACTIONAL-FILL CAPILLARY PIPETTE AND METHOD

Waldemar A. Ayers, Rutherford, N.J., assignor to Becton, Dickinson and Company, East Rutherford, New Jersey

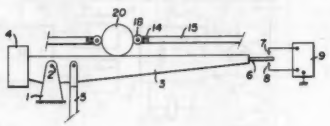
Filed May 18, 1972, Ser. No. 254,607
Int. Cl. B01l 3/02
U.S. Cl. 73—425.4 P 16 Claims

1. A fractional-fill pipette for the quantitation of a liquid comprising;
a. a capillary tube having a bore with non-uniform wettability characteristics relative to the liquid to be quantitated, the non-uniform wettability characteristics being provided in at least two adjacent zones; and
b. said two adjacent zones including a first zone having substantial wettability characteristics in relation to said liquid throughout a bore length and cross-section providing a desired predetermined volumetric capacity when said first zone is filled with said liquid by capillarity, and a second zone of said bore having lower wettability characteristics relative to said liquid so that a resistance to filling of the second zone by capillarity is obtained.

3,952,600
SELF-EQUILIBRATING BALANCE

Adriaan B. Mann, and Jacobus J. C. Vermeulen, both of Delft, Netherlands, assignors to Stichting Waterbouwkundig Laboratorium, Delf, Netherlands

Filed Mar. 26, 1974, Ser. No. 454,815
Claims priority, application Netherlands, Mar. 30, 1973, 7304524
Int. Cl.² G01G 1/38
U.S. Cl. 73—433 8 Claims



1. In a self-equilibrating balance for measuring a progressively changing parameter,
a balance arm,
means defining a fulcrum supporting said balance arm,
a fixed mass mounted at one end of the balance arm,
means for applying a force related to said parameter to the arm,
a screwed spindle extending alongside the balance arm,
a travelling mass mounted on the screwed spindle, said travelling mass having the shape of a body of revolution being arranged to roll along the upper edge of the balance arm and comprising
a frame mounted on said screwed spindle and confining the body of revolution,
two rotary driving members mounted on the frame and both contacting only in the equilibrium position of the balance arm the body of revolution substantially without friction at an equatorial plane, the arrangement being such that in all unbalanced conditions only one said rotary driving member contacts the body, and
centering means serving to maintain the body of revolution centrally, in the transverse sense, on the arm,
drive means for the travelling mass separated from the balance arm, and
guide means for the frame extending parallel to the balance arm.

3,952,601
HELICOPTER ROTOR BLADE BALANCING METHOD

Charles V. Galli, Trumbull, and Robert Zincone, Norwalk, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1974, Ser. No. 533,916
Int. Cl.² G01M 1/22
U.S. Cl. 73—455 3 Claims

1. The method of eliminating pitching moment dynamic unbalance in a helicopter rotor blade comprising the steps of:
A. whirling the blade in rotor motion fashion to determine its degree of pitching moment dynamic unbalance,
B. temporarily attaching at least one ramp-shaped tab of selected weight, span dimension, chord dimension and external surface angularity with respect to the blade chord at a selected station along the blade span and at the blade trailing edge upper or lower surface so as to be positioned totally within the blade chord profile and not extend therebeyond,

C. whirling the blade with the ramp tab or tabs so temporarily attached to determine blade pitching moment dynamic unbalance,

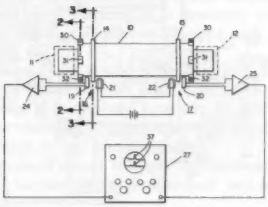
D. adjusting the span dimension, span location or number of ramp tabs and rewhirling the blade until all pitching moment dynamic unbalance is eliminated or reduced to acceptable limits, and

E. permanently bonding the tab or tabs so selected in the final tested position.

3,952,602
ROTOR BALANCING APPARATUS AND SYSTEM

Frank Lyman, Cambridge, Mass., and Joseph Lyman, Northport, N.Y., assignors to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Mar. 3, 1971, Ser. No. 120,393
Int. Cl.² G01M 1/28
U.S. Cl. 73—457 **8 Claims**



1. Balancing apparatus comprising:

an elongated movable object having a longitudinal axis and a fiducial mark applied to said movable object as a standard for measuring the radial variations of relative movement,

magnetic bearing means at opposite ends of said movable object for magnetically suspending the movable object,

means for rotating the movable object about its longitudinal axis,

each said magnetic bearing means constituting a stator portion spaced apart from the rotor portion of the elongated movable object such that a space gap exists between the stator and rotor portions through which magnetic lines of force extend,

said apparatus being characterized by the fact that mass asymmetry of said movable object about said longitudinal axis tends to cause variations in the space gaps of said magnetic bearing means during rotation of said movable object,

said apparatus further including means for detecting unbalance in said rotor, said means comprising a probe in the vicinity of at least one end of said movable object for detecting radial variations of movement thereof relative to the stator portions of said magnetic bearing means,

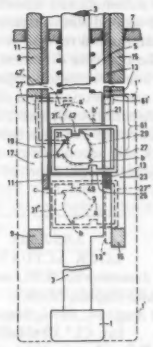
said probe being fixedly positioned relative to the stators of said magnetic bearing means and being free from physical contact with said movable object, and

means responsive to said probe for indicating the radial variations of relative movement within said magnetic bearing means during the revolution of said movable object.

3,952,603
PUSHBUTTON SYSTEM, IN PARTICULAR FOR A PUSHBUTTON OPERATED CAR RADIO RECEIVER

Werner Bernhardt, Wetzlar, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 461,974
Claims priority, application Germany, Apr. 27, 1973, 2321308
Int. Cl.² F16H 38/18
U.S. Cl. 74—10.33 **7 Claims**

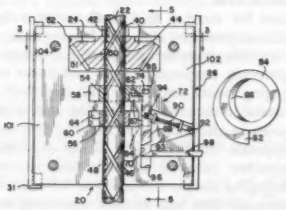


1. A pushbutton assembly of the type having reset, normal, and depressed positions, in which movement of the pushbutton from the normal to the depressed position moves one of a plurality of members to an operating position, comprising sequencing means for selecting the member to be moved upon sequential depressions of the pushbutton, and means for disabling said sequencing means upon movement of the pushbutton to the reset position, such that the most recently selected member remains selected, and for restoring sequencing for subsequent depressions only upon depression of the pushbutton substantially fully to the depressed position.

3,952,604
DEVICE FOR CONVERTING LINEAR MOTION TO ROTARY MOTION

James P. Baudler, 6306 N. Louise Ave., Chicago, Ill. 60646

Filed July 15, 1974, Ser. No. 488,519
Int. Cl.² F16H 25/12
U.S. Cl. 74—57 **12 Claims**



1. A device for converting linear motion to rotary motion, said device comprising a double channel drive shaft having a right-hand channel and a left-hand channel, one end of said shaft being connected to means for cyclically imparting linear movement of said shaft and having a central bore through which said shaft is received, fixedly mounted housing means in which said shaft is axially slidably mounted and in which said gear is rotatably mounted and restrained from a spline connection between said shaft and said gear operatively con-

necting said shaft to said gear and permitting said shaft to move axially of said power gear, first and second directional sleeves spaced axially from said gear and adapted to receive said shaft therethrough, each of said directional sleeves having at least one cam therein positioned to engage one of said channels, said sleeves being rotatably mounted in said housing means while being restrained against axial movement therein, and means operable during each cycle of linear movement of said shaft for automatically locking said first sleeve against rotation during a stroke of linear movement of said shaft in a first direction to thereby cause rotation of said shaft in one direction and for automatically unlocking said first sleeve and then locking said second sleeve against rotation at the end of said stroke so that, upon a reverse stroke of linear movement of said shaft in the opposite direction, said gear will continue to rotate in said one direction, or upon continued rotation of said gear in said one direction, said shaft will be driven in the opposite linear direction until said shaft completes its stroke in said opposite direction at which time said automatic locking means will unlock said second sleeve and lock said first sleeve to repeat the cycle of operation of said automatic locking means.

3,952,605

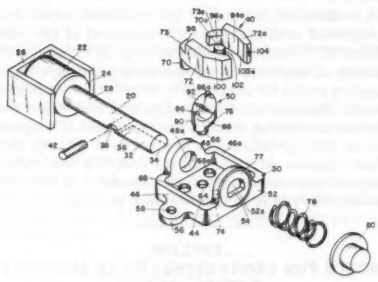
LOCK ACTUATOR

Carl H. Little, Jamestown, N.Y., assignor to Keeler Brass Company, Grand Rapids, Mich.

Filed Aug. 14, 1974, Ser. No. 497,330

Int. Cl.² F16H *25/18*

U.S. Cl. 74—99 R **17 Claims**



1. An actuator assembly for converting linear movement to alternating rotational movement comprising:

a shaft member;

means mounting said shaft member for movement along its linear axis;

means for moving said shaft member between first and second positions along said linear axis;

a rotatable member mounted for rotation about an axis generally perpendicular to said linear axis;

engaging means associated with said shaft member and said rotatable member for rotating said rotatable member to produce alternating rotation in a first direction and in the opposite direction with linear movement of said shaft member between said first and second positions, said engaging means including a follower member shiftable between first and second operating positions, said follower member including a pin member on said shaft member slidably mounted for movement transverse to said linear axis, said rotatable member having a pair of abutment members thereon positioned on opposite sides of said shaft for engagement with said pin member;

means for shifting said follower member from said first operating position to said second operating position with movement of said shaft member between said first and second positions, said shifting means including a pair of arm members pivotally mounted on said mounting means for movement about axes perpendicular to said linear axis; and

first cam means on said rotatable member engageable with said arm members to alternately pivot said arm members into engagement with said pin member to urge said pin member into a position for engagement with one of said pair of abutment members with movement of said shaft between said first and second positions, said follower member in said first operating position urging said rotatable member to rotate in said first direction and in said second operating position urging said rotatable member to rotate in the opposite direction.

3,952,606

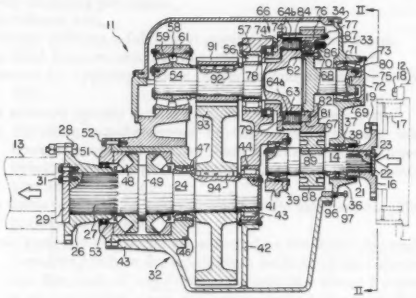
MARINE GEAR ASSEMBLY

Gunter W. Schulz, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 15, 1974, Ser. No. 488,746

Int. Cl.² F16H *3/44, 3/08;* F16D *19/00*

U.S. Cl. 74—377 **8 Claims**



1. A marine gear assembly comprising:

a housing having at least one disengageable and removable end section,

an input shaft supported for rotation within said housing and having a front end extending therefrom for connection with a source of rotary drive,

an output shaft supported for rotation within said housing in parallel relationship to said input shaft and having a back end extending therefrom for delivering rotary drive to a driven load,

a forward drive countershaft journaled for rotation within said housing in parallel relationship to said input shaft and said output shaft and having one end adjacent said removable end section thereof,

a reverse drive countershaft journaled for rotation within said housing about an axis parallel to that of said forward drive countershaft and also having one end adjacent said removable end section of said housing,

first and second transfer gears disposed on said input shaft and said output shaft respectively for rotation therewith,

third and fourth transfer gears disposed on said forward drive countershaft and respectively engaging said first and second transfer gears, one of said third and fourth transfer gears being constrained to rotate with said forward drive countershaft and the other thereof being supported thereon for relative rotation with respect thereto,

fifth and sixth transfer gears disposed coaxially on said reverse drive countershaft, one of said fifth and sixth transfer gears being engaged with said second transfer gear and the other of said fifth and sixth transfer gears being driven by one of said third and fourth gears,

forward drive clutch means for selectively constraining said other of said third and fourth transfer gears to rotate with said forward drive countershaft, said forward drive clutch means including annular clutch elements disposed coaxi-

ally with respect to said forward drive countershaft in proximity to said removable section of said housing, and

reverse drive clutch means for selectively constraining said reverse drive countershaft to rotate with said one of said fifth and sixth gears, said reverse drive clutch means including additional annular clutch elements disposed coaxially with respect to said reverse drive countershaft in proximity to said removable section of said housing.

7. A marine gear assembly comprising:

a housing having a front and a back end and having a disengagable and removable end closure member at said front end,

an input shaft supported for rotation within said housing and having a front end extending through said end closure for connection with a driving engine,

a first transfer gear disposed coaxially upon said input shaft for rotation therewith within said housing,

an output shaft supported for rotation within said housing and having a back end extending through said back end thereof for delivering rotary drive to a driven load,

a second transfer gear disposed coaxially on said output shaft for rotation therewith within said housing,

a forward drive countershaft supported for rotation within said housing, said forward drive countershaft being parallel to said input shaft and said output shaft and having a forward end adjacent to said end closure of said housing,

a third transfer gear disposed adjacent said forward end of said forward drive countershaft in proximity to said removable end closure and being engaged with said first transfer gear,

bearing means mounted in said removable end closure for supporting said third transfer gear,

a fourth transfer gear disposed coaxially on said forward drive countershaft for rotation therewith and being engaged with said second transfer gear,

forward drive clutch means situated between said forward end of said forward drive countershaft and said third transfer gear,

a reverse drive countershaft supported for rotation within said housing and having a forward end adjacent said end closure member,

a fifth transfer gear disposed adjacent said forward end of said reverse drive countershaft in coaxial therewith and being engaged with said third transfer gear,

a sixth transfer gear being disposed coaxially on said reverse drive countershaft for rotation therewith and being engaged with said second transfer gear,

additional bearing means mounted in said end closure for supporting said fifth transfer gear, and

reverse drive clutch means situated between said front end of said reverse drive countershaft and said fifth transfer gear.

8. A marine gear assembly comprising:

a housing having a front and a back end and having a disengageable and removable end closure at said back end,

an input shaft supported for rotation within said housing and having a front end extending from said front end of said housing for connection to a driving engine,

a first transfer gear disposed coaxially on said input shaft for rotation therewith within said housing,

an output shaft supported for rotation within said housing and having a back end extending through said back end thereof for delivering rotary drive to a driven load,

a second transfer gear disposed coaxially on said output shaft for rotation therewith within said housing,

a forward drive countershaft supported for rotation within said housing, said forward drive countershaft being parallel to said input shaft and said output shaft and having a back end adjacent said end closure of said housing,

bearing means in said end closure for supporting said back end of said forward drive countershaft,

a third transfer gear disposed coaxially on said forward drive countershaft for rotation therewith and being engaged with said first transfer gear,

a fourth transfer gear disposed coaxially with respect to said forward drive countershaft and supported for rotation relative thereto and being engaged with said second transfer gear,

forward drive clutch means for selectively causing said fourth transfer gear to rotate with said forward drive countershaft, said forward drive clutch means being adjacent to said end closure of said housing,

a reverse drive countershaft supported for rotation within said housing, said reverse drive countershaft being parallel to said forward drive countershaft and having a back end adjacent said end closure of said housing,

additional bearing means in said end closure for supporting said back end of said reverse drive countershaft,

a fifth transfer gear disposed coaxially on said reverse drive countershaft and being engaged with said fourth transfer gear,

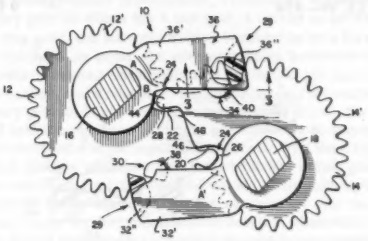
a sixth transfer gear disposed coaxially on said reverse drive countershaft and being engaged with said second transfer gear, and

reverse drive clutch means for selectively causing said sixth transfer gear to rotate with said fifth transfer gear, said reverse drive clutch means being adjacent said end closure of said housing.

3,952,607
VARIABLE SPEED DRIVE MEANS

Thomas F. Ring, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jan. 24, 1975, Ser. No. 543,782
Int. Cl.² F16H *55/04, 35/02*
U.S. Cl. 74—393 **11 Claims**



1. A drive means comprising:

a. a driver member carried on a shaft and rotating at a constant speed through and past 360°,

b. a driven member carried on a shaft and responsive to the rotation of said driver member and rotating through and past 360° and at a variable speed through at least a major portion of said 360° rotation, and

c. means maintaining said driver and driven members in engagement continuously during and past said 360° rotations.

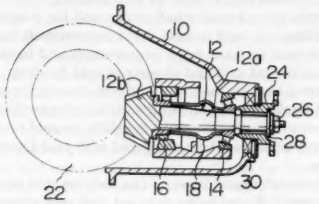
3,952,608
COLLAPSIBLE SPACER IN FINAL DRIVE UNIT OF MOTOR VEHICLE

Hukashi Kanai; Yasuo Mori, and Kyoichi Toyoda, all of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Nov. 26, 1974, Ser. No. 527,376
Claims priority, application Japan, Nov. 27, 1973, 48-136359[U]
Int. Cl.² F16H *57/00*
U.S. Cl. 74—411 **12 Claims**

1. A final drive unit of a motor vehicle comprising: a carrier housing; a drive pinion having a shaft and disposed within said carrier housing; front and rear pinion bearings disposed around the pinion shaft of said drive pinion and being sepa-

rated from each other, said pinion bearings rotatably supporting said pinion shaft within said carrier housing; and a collapsible tubular spacer made of a metal cylinder with a shaped thin wall, disposed around said pinion shaft and interposed in a compressed state between the inner bearing races of said front and rear pinion bearings for supplying a preload to said pinion



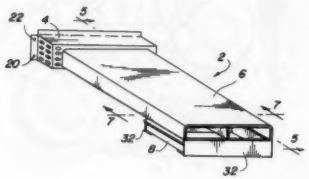
bearings, said collapsible spacer including a cylindrical portion having at least one lateral opening therethrough so as to be able to be twisted by torsion applied on the pinion shaft, said at least one opening being larger in the longitudinal direction of the collapsible spacer than in the circumferential direction of the same.

3,952,609

FOOD WARMING CABINET HUMIDIFIER

Richard O. Klemm, Crystal Lake, Ill., assignor to Food Warming Equipment Company, Elk Grove Village, Ill.

Filed Aug. 5, 1974, Ser. No. 494,454
Int. Cl.² A47J 27/00
U.S. Cl. 99—474 **9 Claims**



1. In a food warming cabinet having stationary open rack shelves for supporting food trays whereby hot air is allowed to circulate around food held therein and further having at least one access door, apparatus for warming and humidifying the food held within said food warming cabinet said apparatus comprising:

a cool air intake chamber defining at least one cool air intake opening and at least one exhaust opening, said cool air intake chamber housed within said food warming cabinet;

a heating element adjacent said at least one exhaust opening of said cool air intake chamber for heating air passing through said at least one exhaust opening;

a hot air tunnel having first and second ends, said first end connected to said cool air intake chamber to enclose said at least one exhaust opening and said heating element, said hot air tunnel for directing the flow of hot air passing through said at least one exhaust opening;

a circulation fan housed within said cool air intake chamber for drawing cool air into said cool air intake chamber through said at least one cool air intake opening and forcing air out of said cool air intake chamber through said at least one exhaust opening, over said heating element and through said hot air tunnel;

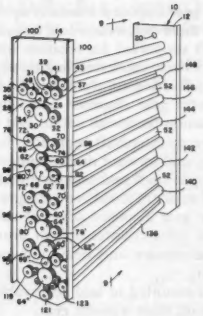
a humidifier pan located directly below said second end of said hot air tunnel, said humidifer pan having a liquid reservoir with a top opening, said top opening of said liquid reservoir lying in the path of air being forced through hot-air tunnel.

3,952,610

GEAR SYSTEM

Henry F. Hope, and Stephen F. Hope, both of 2548 Wyandotte Road, Willow Grove, Pa. 19090

Continuation-in-part of Ser. No. 457,829, April 4, 1974, abandoned. This application Oct. 9, 1974, Ser. No. 513,244
Int. Cl.² F16H 1/12, 1/20
U.S. Cl. 74—421 R **39 Claims**



1. In an improved gear system of greater efficiency, less bearing loading and less power requirement, having a multiplicity of gears vertically mounted in a rack and connected to rotate respective work-producing shafts, said rack including at least one side carrier, the improvement in the gear system which comprises:

a plurality of large power gears positioned vertically one above the other along the side carrier;

a plurality of cluster drive gears of a smaller diameter than the power gears, the cluster drive gears being coaxially rotated by respective power gears at the same rate of rotation;

a plurality of clusters of a plurality of gears, said gears being positioned to be driven by the cluster drive gears, at least some driven gears being connected to rotate the work-producing shafts, the difference in diameter between the large power gear and the cluster drive gear which is coaxially rotated by the respective power gear providing a multiplication of forces from each one of the power gear to each one of cluster drive gear which is rotated by the respective power gear.

3,952,611

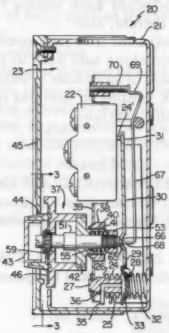
CONTROL UNIT HAVING ADJUSTABLE DIFFERENTIAL AND METHOD OF MAKING THE SAME

Edward P. Cumming, Milford, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Apr. 1, 1974, Ser. No. 456,813
Int. Cl.² G05G 1/04
U.S. Cl. 74—522 **15 Claims**

1. In a control unit having a condition selector means, an actuator and a condition responsive device for actuating said actuator when said condition responsive device senses a condition selected by said selector means, the improvement comprising a lever carried by said unit and being operatively associated with said actuator and said device whereby said device can actuate said actuator by said lever, said selector means having an adjustable part thereof engageable with said lever for providing a pivot point for said lever, said adjustable part

having an adjustable lost motion with said selector means and thereby being adapted to adjust the differential in the operation of said actuator by said device through the adjustment of said lost motion thereof.

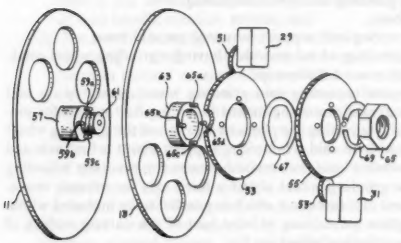


3,952,612

REMOTE CONTROL TRIM BALANCER

Leonard S. Kurkowski, 822 Koehler Court, San Antonio, Tex. 78223, and Clarence C. Burris, Rte. 15, Box 219 C, San Antonio, Tex. 78228

Filed Feb. 22, 1974, Ser. No. 445,003
Int. Cl.² F16F 15/10
U.S. Cl. 74—573 R **3 Claims**



1. A system for controlling the balance of a rotating body comprising:

a. a first counterweight disc mounted at the hub of a fan and having a plurality of holes;

b. a second counterweight disc mounted concentrically with the first disc and having a plurality of holes;

c. means for positioning the holes of the first and second discs with respect to each other and with respect to the hub of a fan;

d. a transmitter for communicating positioning signals to the positioning means; and

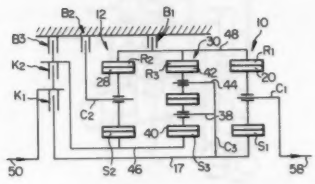
e. a receiver for receiving positioning signals from the transmitter, the receiver being connected to the positioning means.

3,952,613

CHANGE-SPEED TRANSMISSION FOR A PASSENGER AUTOMOBILE

Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed June 18, 1974, Ser. No. 480,520
Claims priority, application Japan, June 20, 1973, 48-68663
Int. Cl.² F16H 57/10
U.S. Cl. 74—759 **1 Claim**

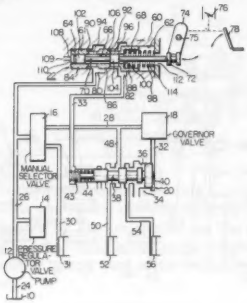


1. A change-speed transmission, comprising a first basic planetary gearset which has a sun gear, a carrier as an output and a ring gear, the sun gear being connectable by a forward input clutch to an input, the ring gear being brakeable by a first brake; a second basic planetary gearset which has a sun gear, a carrier, and a ring gear, the carrier of said second basic planetary gearset being breakable by a second brake, the sun gear of said second basic planetary gearset being connectable by a second clutch to the input and brakeable by a third brake; and dual-pinions planetary gearset which has a sun gear, a carrier and a ring gear, the sun gear of said dual-pinions planetary gearset being connected to the sun gear of said second planetary gear set for simultaneous rotation therewith, the carrier of said dual-pinions planetary gearset being connected to the sun gear of said first basic planetary gearset for simultaneous rotation therewith, and the ring gears of said first and second basic planetary gearsets and the ring gear of said dual-pinions planetary gearset being connected with each other for simultaneous rotation, in which axes of said first and second basic planetary gearsets and said dual-pinions planetary gearset are alined with the input and output, in which said dual-pinions planetary gearset is located between said first and second basic planetary gearsets, and in which the sun gear of said first basic planetary gearset is connected to the input and the ring gear of said first basic planetary gearset is breakeable during first forward speed; the carrier of said dual-pinions planetary gearset and the sun gear of said first simple planetary gear units are connectable to the input and the carrier of said second basic planetary gearset is brakeable during the second forward speed; the carrier of said dual-pinions planetary gearset and the sun gear of said first basic planetary gearset are connectable to the input and the sun gears of said second basic planetary gearset and said dual-pinions planetary gearset are brakeable during the third forward speed; the carrier of said dual-pinions planetary gearset and the sun gear of said second basic planetary gearset and said dual-pinions planetary gearset are connectable to the input during the fourth forward speed; and the sun gears of said second basic planetary gearset and said dual-pinions planetary gearset are connectable to the input and the ring gears of said first and second basic planetary gearset and said dual-pinions planetary gearset are brakeable during a reverse speed.

3,952,614
AUTOMATIC POWER TRANSMISSION HYDRAULIC CONTROL THROTTLE VALVE

Tetsuya Iijima, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

Filed Oct. 3, 1974, Ser. No. 511,722
Claims priority, application Japan, Oct. 6, 1973, 48-111933
Int. Cl.² B60K *21/00*
U.S. Cl. 74—865 **6 Claims**



1. A throttle valve for a hydraulic control system of an automatic power transmission of a motor vehicle, comprising a housing formed therein with a cavity, an inlet port into which hydraulic fluid output pressure is produced and which is communicable with a drain, an external valve spool slidably fitted in said cavity and formed therein with a bore and urged in one direction by said output pressure, said bore communicating with said inlet port and being communicable with said outlet port to produce said output pressure therein, biasing means urging said external valve spool in another direction opposite to said one direction, an internal valve spool slidably fitted in said bore and movable in accordance with an output of an engine in said one and another directions to provide fluid communication between said outlet port and said bore and between said outlet port and said drain to increase and decrease said output pressure, said external and internal valve spools having a common neutral position which is constant with respect to each other and in which said output pressure is equal to a throttle pressure varied in accordance with the output of the engine, said external valve spool being responsive to movements of said internal valve spool from said neutral position in said one and another directions to be movable toward said neutral position by said output pressure and the action of said biasing means, respectively.

6. A throttle valve as claimed in claim **1**, wherein the output of the engine is controlled by an accelerator pedal, in which said internal valve spool is adapted to be connected to said accelerator pedal of said motor vehicle through a linkage mechanism.

3,952,615
SAW CHAIN SHARPENING SYSTEM

Clarence Eugene Benson, Milwaukie, Oreg., assignor to Carlton Company, Portland, Oreg.

Filed Jan. 22, 1975, Ser. No. 542,925
Int. Cl.² B23D *63/16*; B24B *3/36*
U.S. Cl. 76—25 A **9 Claims**

1. Apparatus for sharpening cutters distributed along a saw chain comprising

support means defining a support path along which an elongate reach of saw chain may be moved longitudinally through the apparatus,

a plurality of spaced-apart sharpening stations distributed along said path,

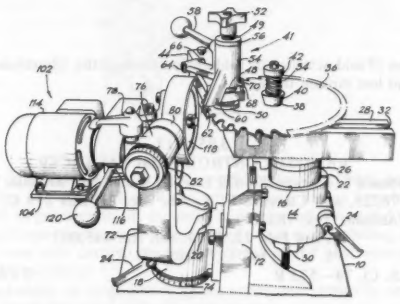
sharpening means adjacent each station for sharpening a cutter positioned therein, and

positioning means adjacent said path operable to advance said reach of chain along said path to position selected cutters on said reach of saw chain in different sharpening stations with slack existing in portions of said reach between said sharpening stations.

3,952,616
ADJUSTABLE GRINDING APPARATUS

Bernard Scott Varley, Sabden, near Blackburn, England, assignor to Automatic Machine & Engineering Co. Limited, England

Filed Nov. 20, 1974, Ser. No. 525,706
Claims priority, application United Kingdom, Nov. 24, 1973, 54645/73
Int. Cl.² B23D *63/14*
U.S. Cl. 76—40 **11 Claims**



1. A grinding machine comprising:

a. a base,

b. a work-piece support mounted on said base,

c. a grinding wheel assembly having a grinding wheel rotatably mounted thereon,

d. means mounting said grinding wheel assembly on said base, said mounting means including first means for pivotally adjusting the plane of rotation of the grinding wheel relative to said work-piece support about a first axis and a second axis and second means for pivotally adjusting the grinding wheel about a third axis for arcuate movement in a direction which is parallel to or included within a plane containing at least part of the cutting surface of the grinding wheel, and

e. feed means for moving the grinding wheel along said third axis in a direction parallel to the rotational axis of said wheel.

3,952,617
WRENCH

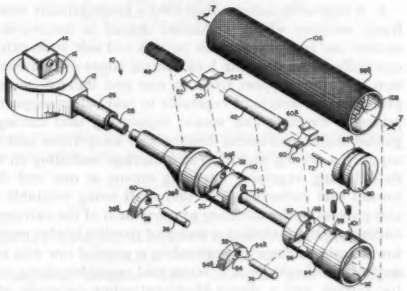
Michael Joseph Gegg, Harahan, La., assignor to Ray & Spielman, Baton Rouge, La.

Continuation-in-part of Ser. No. 410,281, Oct. 26, 1973, abandoned. This application Mar. 19, 1975, Ser. No. 559,889
Int. Cl.² B25B *13/46*
U.S. Cl. 81—62 **5 Claims**

1. A two-ended, elongated lever bar having:

a. at one end of said bar a socket holding means for holding a socket in engagement with said bar, said socket holding means being rotatable in a plane perpendicular to the long axis of said bar;

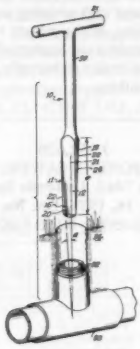
b. force transference means engageable with said socket holding means;
c. a shaft means cooperative with said force transference means and extending through said bar, said shaft means being rotatable within said bar and extending beyond the other end of said bar, and said shaft means being for application of force applied thereto to said force transference means;
d. a hollow handle which,
i. covers at least a portion of said shaft means extending beyond the other end of said bar;
ii. is rotatable about the long axis of said bar;
iii. has a first engagement means within its interior for engaging a handle rotation control means, said handle rotation control means being carried by a first carrier means, said first carrier means being rigidly attached to said other end of said bar and encasing at least a portion of shaft means which extends beyond the other end



of said bar, said handle rotation control means being selectively positionable with respect to said first engagement means so as to render the handle only rotatable in the direction dictated by the selected position of said handle rotation means, and
iv. has a second engagement means within its interior for engaging a shaft rotation control means, said shaft rotation control means being carried by a second carrier means, said second carrier means being rigidly attached to said shaft means, and said shaft rotation control means being selectively positionable with respect to said second engagement means so that rotation of the handle in the direction dictated by the selected position of said shaft rotation control means results in rotation of said shaft means in the same direction; and
e. selection means for selectively positioning said handle rotation control means and said shaft rotation control means.

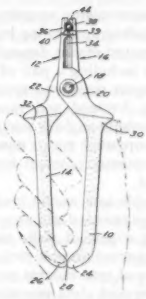
3,952,618
EXTRACTOR FOR PLASTIC RISERS
Paul Seamon, Garden Grove, Calif., assignor to Honey Bee Tool Company, Whittier, Calif.
Filed May 23, 1975, Ser. No. 580,429
Int. Cl.² B25B *13/48*
U.S. Cl. 81—71 **6 Claims**

1. A device for extracting plastic risers from threaded fittings such as a tee located in a sprinkler pipe, said device comprising:
a shallow, frustro-pyramidal shank having slightly concaval sides, each corner of said frustro-pyramidal shank being at an angle of between 1.5° and 5° with respect to the longitudinal axis of said shank, and said shank having a left-handed twist between 4° and 36° per inch of shank length;



an extension rod affixed to said shank; and
handle means affixed to said extension rod.

3,952,619
TUBE ASSEMBLY TOOL
Roger J. Cook, Highland, Mich., assignor to Numatics, Incorporated, Highland, Mich.
Filed Feb. 27, 1975, Ser. No. 553,454
Int. Cl.² B25B *7/02*
U.S. Cl. 81—420 **1 Claim**



1. A hand tool for use in forcing plastic tubing into a retaining socket which comprises:
a. a pair of handles lying in a plane,
b. a cross-over portion on each of said handles,
c. means pivoting said handles together at the cross-over portions,
d. a head end on each of said cross-over portions positioned to provide a clamping action, each of said head ends having a portion extending laterally away from the general plane of the handles, said laterally extending portions having a first facing smooth surface groove on an axis extending transverse to the plane of said handles and a second facing smooth surface groove on an axis perpendicular to said first groove parallel to the plane of said handles, said grooves being shaped to receive a portion of a sidewall of a tube to be gripped,
e. each of the handles being formed at the digital ends with a curved portion extending in the direction of the other handle and dimensioned to contact to prevent full closing of the

head ends on each handle and having a curved, outwardly extending nub adjacent the pivoting means to serve as pressure areas for the thumb and forefinger of a user, and

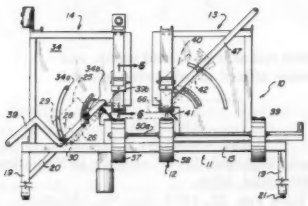
f. blades formed on said head ends between said laterally extending portions and said pivoting means having portions terminating at cutting edges which respectively lie in a common plane whereby said blades will overlap in scissors fashion as said head ends are brought together to serve as a cutter for plastic tubing.

3,952,620

SMALL COMPONENT SAWING ASSEMBLY

James D. Adams, Box 7462, Colorado Springs, Colo. 80933

Filed May 16, 1974, Ser. No. 470,625
Int. Cl.² B23D *45/14*; B26D *3/02*; B27B *5/04*
U.S. Cl. 83—422 **6 Claims**



1. A small component sawing assembly comprising

a. base means including upstanding legs;

b. stationary saw mount means depending from one side of said base means including a pair of walls each having a pair of spaced apart registered arcuate slots, and a saw assembly having forward and rear mounts arcuately moveable at a variable angle in said slots providing a pair of spaced apart opposed motor mounting means for the saw providing optimum contact between said saw and lumber being cut,

c. a laterally movable saw mount means mounted on said base means moving toward and away from said stationary mount including a pair of walls each having a pair of spaced apart registered arcuate slots, and a saw assembly having forward and rear mounts pivotally mounted at a variable angle in said slots providing a pair of spaced apart opposed motor mounting means utilizing a variable pivot point for the saw providing optimum contact between said saw and lumber being cut;

d. a first endless conveyor assembly including lumber hooks mounted closely adjacent said stationary saw mount;

e. a second endless conveyor assembly including lumber hooks mounted closely adjacent to and movable with said movable saw mount means;

f. means for conjointly rotating said conveyors for moving lumber through said saws; and

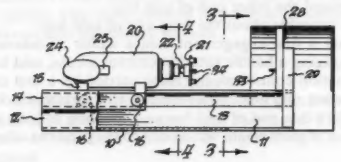
g. variable lumber hold-down means including a pair of elongated, horizontally disposed shoe means positioned above and parallel with said first conveyor assembly, and elongated, horizontally disposed shoe means positioned above and parallel with said second conveyor assemblys, and each including upwardly extending pivoted links on each end of each said shoe means providing pivot mounting means for each said shoe means permitting each shoe means to swing rearwardly and upwardly holding lumber on said conveyor means.

3,952,621

POTATO CUTTING MACHINE

James Chambos, 218 Garrison Road, Williamsville, N.Y. 14221

Filed Dec. 6, 1974, Ser. No. 530,081
Int. Cl.² B26D *1/02*
U.S. Cl. 83—733 **3 Claims**



1. A vegetable cutter comprising a longitudinally extending frame member which is channel shaped in transverse cross section and comprises a base portion and side walls extending upwardly at the opposite longitudinal edges of said base portion, a cutter support fixed to one end thereof, means for presenting an article of vegetable to said cutter support comprising a carriage and means supporting said carriage for guided linear movement toward and away from said cutter support, a driving motor on said carriage including an output shaft having vegetable engaging means at one end thereof toward said cutter support, said shaft being rotatable on an axis parallel to the direction of movement of the carriage, said cutter support including a series of parallel blades projecting toward said carriage and extending in a radial row with respect to the axis of said shaft to score said vegetable along concentric circles, and a slicing blade extending generally at right angles to said shaft axis and spaced toward said carriage from said cutter support for continuously slicing said scored portions during rotation of said shaft to form a series of helical strips of said vegetable, said carriage supporting and guiding means comprising longitudinal guiding formations extending along said frame member side walls, and means on said carriage engaging said guiding formations for free movement of said carriage longitudinally of said frame member, said carriage being movable manually to hold said vegetable against said cutter support during operation of said cutter to produce sliced strips of uniform thickness.

3,952,622

VICE MOUNTED MULTIPLE-USE BAND SAW WITH DETACHABLE WORK SURFACE

Joseph Majus, Box 99, Camp Lake, Wis. 53109

Continuation-in-part of Ser. No. 320,094, Jan. 2, 1973, abandoned. This application Aug. 30, 1974, Ser. No. 502,017
Int. Cl.² B23D *53/04*, *55/04*; B27B *13/04*
U.S. Cl. 83—799 **3 Claims**

1. A multiple position band saw device for mounting on the fixed jaw portion of a bench vice comprising

a band saw with driving motor, and

clamping means for mounting said band saw on the fixed jaw portion of said vice comprising,

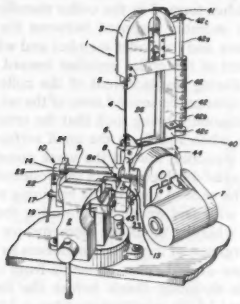
a substantially C-shaped section,

a tongue means attached to the bight portion of said C-shaped section and extending toward the fixed jaw of said vice for stabilizing said band saw during horizontal cutting,

an adjustable L-shaped section movably attached to one of the arms of said C-shaped section for engaging said vice adjacent said fixed jaw to stabilize said band saw,

a shaft secured to and extending the length of the bight portion of said C-shaped section for rotatably carrying said band saw; and a work surface for use when the band

saw is in the vertical position comprising, a table, and



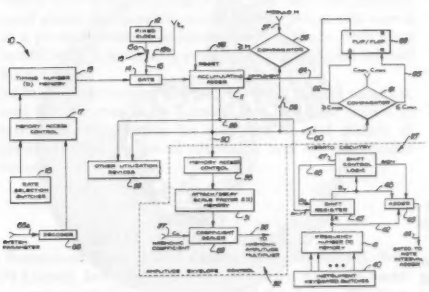
at least three leg members connecting three spaced points on said table only to said clamping means.

3,952,623

DIGITAL TIMING SYSTEM FOR AN ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Nov. 12, 1974, Ser. No. 523,034
Int. Cl.² G10H 1/02
U.S. Cl. 84—1.24 10 Claims



1. In an electronic musical instrument, a digital timing system comprising:

timing number selection means for selecting a digital number from a set of such numbers,

an accumulating adder, and

gating means for repetitively gating said selected digital number to said accumulating adder for arithmetic addition to the previous contents thereof at a regular rate, digital timing signals being obtained from selected bit positions of said accumulating adder, and

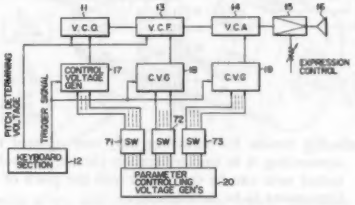
utilization means in said electronic musical instrument for employing said obtained digital timing signals to implement tone modification functions.

3,952,624

ELECTRONIC MUSICAL INSTRUMENT CAPABLE OF GENERATING TONE SIGNALS HAVING PITCH FREQUENCY, TONE COLOR AND VOLUME ENVELOPE VARIED WITH TIME

Genichi Kawakami, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan

Filed Nov. 1, 1974, Ser. No. 520,146
Claims priority, application Japan, Nov. 2, 1973, 48-123710
Int. Cl.² G10H 1/02, 5/02
U.S. Cl. 84—1.26 3 Claims



1. An electronic musical instrument of the keyboard type comprising:

a keyboard section including first means responsive to key operation on a keyboard for providing a pitch determining voltage the amplitude of which is a function of the note of an operated key on said keyboard, and second means responsive to key operation on said keyboard for providing a trigger signal indicative of key operation on said keyboard;

voltage controlled tone signal generating means including a voltage controlled oscillating means connected to receive said pitch determining voltage from said first means and for generating a tone signal the frequency of which is a function of the amplitude of said pitch determining voltage;

first envelope generating means connected to receive said trigger signal from said second means for generating a first envelope signal the amplitude of which varies with time, the envelope signal having voltage controlled parameters including at least one of rise time and decay time;

means coupling said first envelope signal of said first envelope generating means to said voltage controlled oscillating means for varying the oscillation frequency thereof as a function of said first envelope signal;

first parameter controlling voltage generating means for generating and coupling parameter controlling voltages to said envelope signal generating means, the parameter controlling voltages including a rise time controlling voltage and a decay time controlling voltage; and

first switching means connected between said first envelope generating means and said first parameter controlling voltage generating means for interchanging between said rise time controlling voltage and said decay time controlling voltage, both being selectively coupled to said first envelope generating means.

3,952,625

ELECTRONIC TUNING DEVICE

Richard H. Peterson, 11748 Walnut Ridge Drive, Palos Park, Ill. 60464

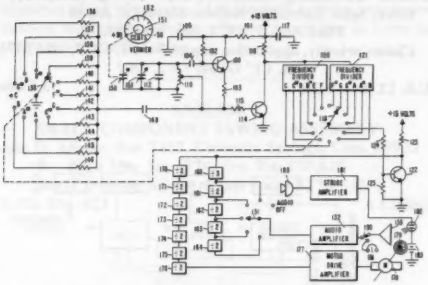
Filed Feb. 18, 1975, Ser. No. 550,523
Int. Cl.² G10G 7/02; G01R 23/14
U.S. Cl. 84—454 10 Claims

1. A tuning device for tuning musical instruments and for intonation training, comprising:

a master oscillator operating at a radio frequency;

means including frequency dividers for simultaneously deriving from said master oscillator a series of audio frequencies that approximate the notes of a predetermined musical scale over a range of at least an octave;

a utilization circuit;



selector means for selecting only one of said notes and connecting it to said utilization circuit, whereby the selected note can be compared with the pitch of a musical instrument to be tuned; and

additional means controlled by said selector means for shifting the frequency of said master oscillator slightly so as to place the selected note at its exact position in the predetermined musical scale.

3,952,626

QUICK-RELEASE FASTENERS

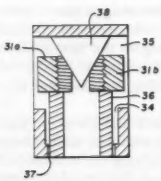
Phillip Townsend, 87 Wentworth Road, Vaucluse, 2030 New South Wales, Australia

Division of Ser. No. 295,016, Oct. 4, 1972, abandoned. This application Oct. 25, 1974, Ser. No. 517,863

Claims priority, application Australia, Oct. 7, 1971, 6559/71; Nov. 18, 1971, 7080/71

Int. Cl.² F16B 37/10

U.S. Cl. 85—33 3 Claims



1. A quick release fastener device which is adapted to engage with the threaded shank of a screwed member and to clamp against a work piece, the fastener device comprising:

a. a collet member comprising at least two independent segmental collet elements which are adapted to be fitted together in cooperating relationship to define a threaded aperture, said collet elements having notches formed therein at one end thereof and converging to respective planes of separation along which the collet elements separate from one another upon being fitted together;

b. a retaining member for retaining the collet elements in said cooperating relationship and including engaging means adapted to hold said collet elements against rotation with respect to one another and with respect to said retaining member;

c. said retaining member being in the form of a rigid cage having first and second zones spaced axially of the threaded shank, the first zone comprising a pocket in which the collet member is snugly fit to retain the collet elements in said cooperating relationship, and the second zone providing for lateral separation of the collet elements and being of larger cross-section than said collet members in said cooperating relationship;

d. an anvil surface on the end of said retaining member remote from said pocket;

e. wedge means formed within and being integral with the second zone of the retaining member, said wedge means flanking said second zone and converging towards a wedge tip normally directed at and aligned axially with said notches formed in the collet members;

f. a spacer member disposed between the surface of the work piece and the collet member and which resists axial movement of the collet member toward the work piece surface during displacement of the collet member from the first zone to the second zone of the retaining member;

g. the arrangement being such that the retaining member is movable when struck on the anvil surface and forced in an axial direction toward the work piece surface effects relative axial displacement of the collet member from the first to the second zone of the retaining member simultaneously with said wedge tips entering the collet member notches whereby the collet elements are forced apart by the divergence of the wedge members to effect complete separation of said collet elements from one another and from the threaded shank before the limit of the axial movement of the retaining member is attained.

3,952,627

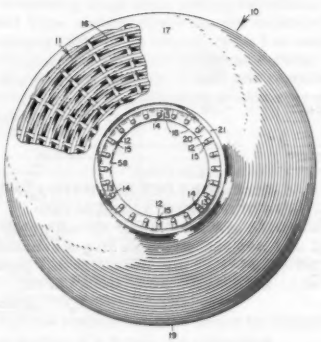
SLOT FORMER ASSEMBLY FOR USE IN SOLID PROPELLANT ROCKET MOTORS

Franklyn A. Gardiner; Oscar M. Hawkins, and Garland K. Grace, all of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Aug. 27, 1962, Ser. No. 219,569

Int. Cl.² C06B 21/00

U.S. Cl. 86—1 R 3 Claims

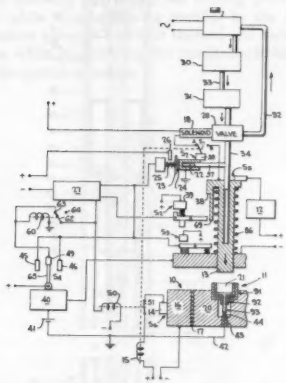


1. A slot former assembly for use in fabricating the solid propellant in a motor case for a solid propellant rocket motor comprising an outer hollow core, an inner tubular core and a flexible slot former comprising a skeleton frame consisting of stiffening rods that are retained in spaced relation to each other by means of a cord woven thereon in a basket weave and provided with a covering of flexible material operatively connected to said hollow core, whereby when said assembly is positioned in said motor case and the solid propellant is cast therein about said assembly, a slotted cavity configuration will be provided in the solid propellant in said motor case.

3,952,628
APPARATUS FOR MANUFACTURING DETONATORS AND RESISTORS

George T. Boswell, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 18, 1974, Ser. No. 452,478
Int. Cl.² C06B 21/00; F42B 33/10
U.S. Cl. 86—1 R 8 Claims



1. An apparatus for assemblying electronic detonators wherein a mass of pyrotechnic composition is loaded into a housing and compressed by a ram, and including an electric means for controlling movement of said ram, the improvement which comprises:

first means electrically connected to said mass during compression for detecting the instant at which a predetermined electrical resistance of said mass has been attained;

second means for simultaneously sensing when said ram is at a predetermined maximum travel distance, indicating insufficient volume of pyrotechnic composition in said housing; and

third means interconnecting said first and second means to said electric means for causing said electrical means to terminate compression by said ram at said instant of predetermined electrical resistance and for insufficient volume.

3,952,629
SMALL ARMS SILENCER

Jack Boccarossa, Rock Island County, Ill., and John S. Post, Scott County, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 13, 1975, Ser. No. 549,575
Int. Cl.² F41C 21/18
U.S. Cl. 89—14 D 4 Claims

1. A small arms silencer for reducing the muzzle blast gas flash and barrel compensation which comprises:

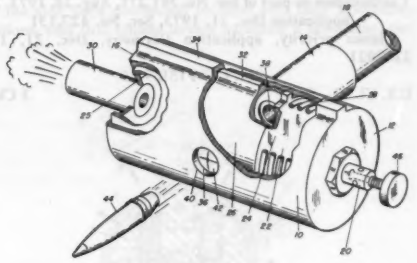
a "T" shaped hollow tubular housing having a partially closed front end, a partially closed rear end, and a tubularly shaped transversely positioned integral middle muzzle member which slidably fits on a muzzle barrel, the wall of said tubular housing having an exit orifice therein axially aligned with said muzzle member and said muzzle barrel, said wall having a longitudinally positioned keyway groove therein;

a split plastic restrictor fixedly positioned in said exit orifice;

an adjustable relief valve fixedly positioned in the front end of said housing;

means for releasing said muzzle blast gas from said housing at a frequency which is inaudible, said means being fixedly attached to the rear end of said housing and which communicates therewith;

piston means slidably positioned in said housing for allowing a projectile to pass through said piston means and said



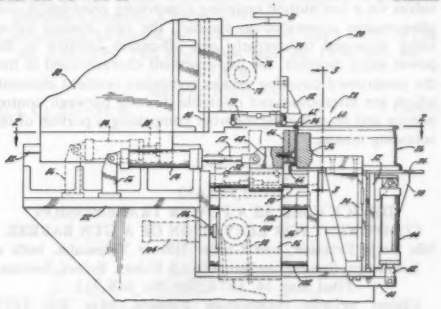
housing when said means is in an "open" position, for closing off said exit orifice of said housing after said projectile has passed through said housing, for providing barrel compensation, and for blocking the view of said muzzle blast gas flash; and

spring means for returning said piston means from a "closed" position to said "open" position to permit use of said silencer on a rapid automatic fire weapon.

3,952,630
TRUCK RIM EDGE MILLING APPARATUS

Vernon Fencl, Northbrook, and Alberts Roze, Chicago, both of Ill., assignors to Grotnes Machine Works, Inc., Chicago, Ill.

Continuation of Ser. No. 414,705, Nov. 12, 1973, abandoned.
This application Mar. 5, 1975, Ser. No. 555,686
Int. Cl.² B23C 3/12
U.S. Cl. 90—15 R 7 Claims



1. Apparatus for machining the end edge surfaces of generally cylindrical truck rims for removing the weld projections thereon in an automated production line comprising in combination a frame having a work station for receiving rims transported along a pass line with the rim axis being perpendicular to the pass line, clamping means including an inner clamp member movable transversely with respect to the rim in the work station and an outer clamp member movable radially with respect to said rim and adapted to hold the rim stationary against said inner clamp member, a pair of spaced apart power heads carrying rotatable cutting tools mounted on said frame adjacent said work station, said power heads and cutting tools being movable transversely relative to the axis of a rim held in said fixed position in said work station and actuator means for moving said power heads and cutting tools located at a prede-

termined spaced apart distance transversely with respect to the axis of said fixed rim into said work station to remove the weld projections at opposite ends of said rim.

3,952,631

PRESSURE MEDIUM CONTROL DEVICE

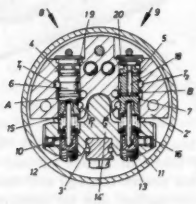
Günther Strauff, Kaarst, Germany, assignor to Langen & Co., Duesseldorf, Germany

Continuation-in-part of Ser. No. 391,271, Aug. 24, 1973. This application Dec. 21, 1973, Ser. No. 427,131

Claims priority, application Germany, Dec. 21, 1972, 2242021

Int. Cl.² F15B 9/10

U.S. Cl. 91—372 3 Claims



1. In a pressure fluid control device for controlling working chambers of a servo-motor comprising two control valves operatively connectable to actuating means fixedly connected to a power input member through relative movements between the input member and a power output member connected to the power input member by resilient coupling means, the servo-motor is connected to the power output member, means including reaction areas on the control valves for reflecting developing pressures to the power input member, power transmission necessary for actuating the control valves being effected from the actuating means to the control valves via a lost motion coupling comprising prestressed coupling means connected in parallel, the two control valves being arranged transversely and off-center relative to the power input member, the improvement characterized in that the prestressed coupling means comprises resilient elements which are interposed and operable directly between control pistons and an actuating member comprising a portion of the actuating means.

3,952,632

DEVICE USED AS A POWER TRANSMISSION COMPONENT FOR ELEVATION OF A GUN BARREL

Nils Borje Eriksson, and Gustav Hilmer Tidemalm, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed May 14, 1974, Ser. No. 469,711

Claims priority, application Sweden, May 23, 1973, 7307218

Int. Cl.² F01B 15/02, 31/00

U.S. Cl. 92—117 R 3 Claims

1. Power transmission apparatus for controlling the elevation of a gun barrel comprising:

first and second parts in telescopic relation with each other with said first part being secured to a base for the gun and with said second part being attached to the gun barrel,

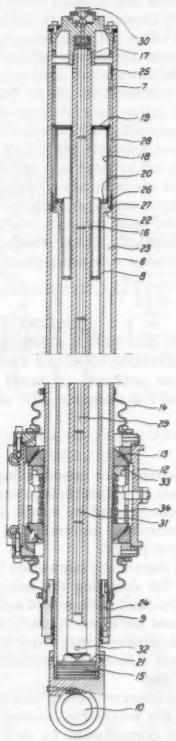
said first part including a first piston and a first piston rod secured to said first piston, said first piston being slidable in a first cylinder defined by said second part,

a second piston having a second piston rod secured thereto, said second piston being slidable within a second cylinder defined by said first part and said second piston rod being attached to an end portion of said second part,

a first chamber defined at least in part by the inner wall of said first cylinder and the outer wall of said first piston rod and filled with a low compressibility fluid.

a second chamber defined at least in part by the outer surface of said second piston rod and the inner wall of said first piston rod and filled with a high compressibility fluid

said second piston rod being tubular and having a port communicating with said second chamber,



an inner tube supported within said second piston rod,

a filling and draining valve connected to one end of said inner tube and terminating a predetermined distance from said second piston,

said second chamber communicating with a gap betwen the inner wall of said first cylinder and the outer wall of said first piston,

and sealing means between the inner wall of said first cylinder and the outer wall of said first piston.

3,952,633

DEVICE FOR INSERTING PARTITION LATTICE IN CARTON

Hidekazu Nakai, No. 34-9, 1-chome, Kami-Ikebukuro, Toshima, Tokyo, Japan

Filed Apr. 10, 1974, Ser. No. 459,855

Claims priority, application Japan, Apr. 16, 1973, 48-44561

Int. Cl.² B31D 3/04; B31B 11/02

U.S. Cl. 93—37 R 2 Claims

1. An apparatus for inserting into a hollow carton a partition lattice which is assembled from longitudinal partition panels having slits at equal spaces extending upward from the lower

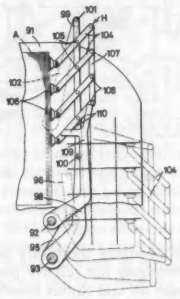
edges thereof and transverse partition panels having slits at equal spaces extending downward from the upper edges thereof, whereby inserting said slits into one another forms a lattice-like shape, said apparatus comprising:

a support table;

feeder means toward the front of said table for feeding the folded partition lattices overlapping one on the other in a vertical arrangement on the table towards the front end of said table;

opening means for opening the folded partition lattice, said opening means comprising:

a plate member in front of the leading partition lattice, said plate member being parallel to the longitudinal partition panel at one side thereof and movable therefrom while maintaining the parallel relation in respect to the partition lattice;



pivoted arms, equal to the number of partition panels, pivoted on said plate member at an angle of 45° before the panel is moved with the same intervals therebetween as between said transverse partition panels;

suction discs provided on the ends of said arms sucking the end portions of said transverse partition panels; and

a turnable plate adapted to cause said arms to turn synchronously 90° when said plate member moves away from said partition lattice;

lifting means at the front of said opening device for lifting the opened partition lattice as said lifting means elevates;

transfer means for transferring the lifted partition lattice to a position directly above a waiting hollow carton; and

means for inserting the partition lattice into said carton and for releasing the partition lattice from being held by said transfer means.

3,952,634

CARTON BLANK FORMING APPARATUS

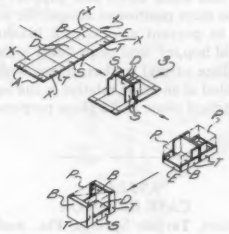
Paul Ferdinand Rollins, Stevenage, and Christopher John Chamberlain, St. Neots, both of England, assignors to Bowater Packaging Limited, London, England

Filed Sept. 9, 1974, Ser. No. 503,941

Int. Cl.[2] B31B *3/26*

U.S. Cl. 93—49 R **14 Claims**

1. Blank folding apparatus for folding a blank of the type described into a carton comprising a frame, means on said frame for supporting a blank at a first folding station, folding means for folding such blank at said first folding station from a lay-flat condition into a condition with its divider panels in back-to-back relationship and upstanding relative to the base panels with the side flaps connected to the divider panels upstanding relative to the divider panels, means on said frame for supporting the partially folded blank at a second folding station, folding means associated with said second folding station to fold the side and end flaps connected to the base panels upwardly relative to the base panels and to fold in the glue flaps to lie against said side flaps, whereupon the carton may then be removed from said second folding station, said blank support means at said first folding station including a pair of oppositely disposed plates spaced apart a distance slightly greater than the width of the divider panels and on which the side flaps foldably connected to the divider panels rest, and ledges on which the end flaps rest, a first folding device at said first folding station for pushing the blank past the plates towards said second folding station and at the same time to fold the divider panels into back-to-back relationship and the side flaps connected to them into their upstanding positions, said first folding device including a sub-frame, two



generally L-shaped folding members, means pivotally connecting each of said L-shaped members adjacent the end of one of the arms of the L to said sub-frame, means supporting said sub-frame on said main frame and a reciprocatable cross-member vertically slidable relative to said sub-frame under the action of a ram, a link pivotally connecting said cross-member to each L-shaped folding member so that, upon sliding movement of the cross-member, relative to the sub-frame, each L-shaped folding member will be rocked through 90°, thereby folding the divider flaps into back-to-back relationship from their lay-flat condition.

3,952,635

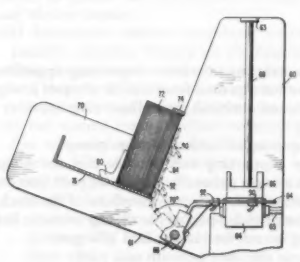
VERTICAL CARTON ERECTOR

Herman Dewitt Mims, Charlotte, N.C., assignor to D and B Machine Company, Charlotte, N.C.

Continuation-in-part of Ser. No. 347,494, April 3, 1973, Pat. No. 3,859,896. This application Sept. 20, 1974, Ser. No. 507,919

Int. Cl.[2] B31B *1/06*

U.S. Cl. 93—51 R **5 Claims**



1. In a carton erecting apparatus of the type wherein a stationary die, reciprocable plunger and carton blank feeding means are carried by a frame, said apparatus including a carton blank reservoir remote from said die and said plunger and comprising a carton hopper to releasably and sequentially present said carton blanks to said carton blank feeding means, said feeding means being capable of advancing to said hopper, engaging the presented carton blank and placing said blank on said die in carton erecting position, the improvement compris-

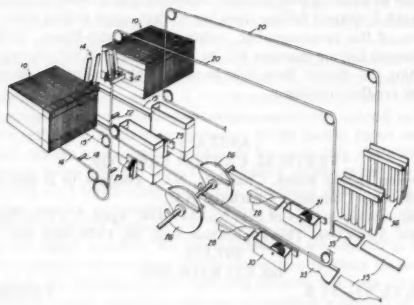
ing said hopper having a straight inclined smooth carton blank support surface upon which a stack of flat carton blanks can rest on edge, the angle of inclination of said support surface relative to the horizontal being substantially equal to the angle of repose so that the carton blanks are on the verge of sliding down said inclined surface under their own weight, carton blank pusher means carried by said hopper to push said stack of cartons down said inclined support surface, spring means biasing said pusher means to maintain substantially equal pressure on the leading carton regardless of the length of the stack, said pusher means exerting a pressure against the stack directly porportional to the length of the stack, lateral guide means to guide said stack down said support surface and a plurality of carton stops positioned around the lower most end of said hopper to prevent said carton blanks from being pushed out of said hopper; said stops being located in a plane parallel to the plane of said pusher means with both of said planes being located at an angle relative to the support surface intermediate a vertical plane and a plane perpendicular to said support surface.

3,952,636

CASE ERECTOR

Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Filed Aug. 9, 1974, Ser. No. 496,028
Int. Cl.² B31B *1/06, 1/76*
U.S. Cl. 93—53 SD **11 Claims**



1. In a case erecting machine dispensing apparatus for dispensing cases one at a time from a stack of cases juxtaposed in upright, flattened positions, said dispensing appratus comprising

a. suction cup coupled with a vacuum pump;

b. a carriage supporting said suction cup for reciprocal movement along a generally horizontal path into and out of engagement with end case members of the stack, said carriage comprising a pair of parallelogrammatic linkages and biasing means for biasing said linkages;

c. a drop chute disposed beneath said path;

d. means for controlling the suction applied to said suction cup by said vacuum pump whereby the suction cup may grip and remove end case members one at a time from the stack along said path to a position over said drop chute and there release the cases enabling them to fall down into the drop chute; and

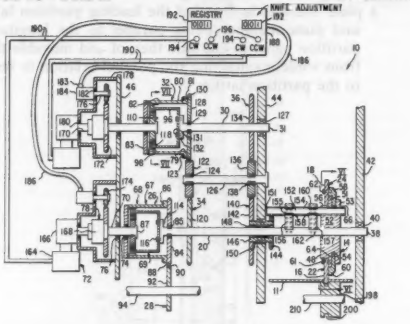
e. a magazine for storing a stack of flattened cases, said magazine including a pair of externally threaded support shafts upon which the cases may be manually supported and drive means for rotating said shafts and for advancing the flattened cases toward said suction cup.

3,952,637

APPARATUS FOR CHANGING THE ROTARY POSITION OF A SLOTTER MEMBER AND FOR CHANGING THE RELATIVE POSITION BETWEEN FIXED AND MOVABLE KNIVES ON THE SLOTTER MEMBER

Roy Ralph Lambert, and Gordon Lawrence Morgret, both of Baltimore, Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Apr. 14, 1975, Ser. No. 567,488
Int. Cl.² B31B *1/22*; B26D *7/26*
U.S. Cl. 93—58.2 R **16 Claims**



1. Apparatus for changing the rotary position of a slotter member and for changing the relative position of fixed and movable knife means on said slotter member, comprising:

a first rotatable shaft means having at least one of said slotter members secured thereto;

said slotter member having a fixed knife means secured thereto and a movable knife means mounted thereon;

a drive means;

a first phase changing means connected between said first shaft means and said drive means for rotating said slotter member;

a second rotatable shaft means spaced from said first shaft means;

a linking means connected between said second shaft means and said movable knife means;

a second phase changing means connected between said first shaft means and said movable knife means through said linking means; and

a selectively operable remote control means for:

1. operating said first phase changing means to selectively change the rotary position of said slotter member forward and backward with respect to said drive means said second phase changing means and said linking means maintaining the relative position of said fixed and movable knife means during operation of said first phase changing means, and for

2. operating said second phase changing means independently of said drive means to selectively change the position of said movable knife means forward and backward relative to the position of said fixed knife means.

3,952,638

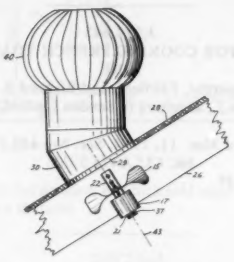
FANS FOR USE WITH TURBINE VENTILATORS, AND METHODS AND APPARATUS FOR SUPPORTING THE SAME

John V. Felter; John A. Bond, and Kenneth M. Rudine, all of P.O. Box 7464, Houston, Tex. 77008

Filed Mar. 10, 1975, Ser. No. 556,694
Int. Cl.² F24F *7/02*
U.S. Cl. 98—43 R **20 Claims**

6. In combination with a rotary ventilator and a fan-motor assembly mounted beneath said ventilator, apparatus compris-

ing a first elongate element adapted for connection at an intermediate point of its length to the motor of said fan-motor assembly, second and third elongate elements each bendable to L-shaped form intermediate of their lengths whereby one end of each of said second and third elongate elements may be connected to supports at opposite sides of said rotary ventilator and the other end of each of said second and third



elongate elements may be connected against the opposite ends of said first elongate element, said other ends of said second and third elongate elements being disposable in line with or at any angle to said first elongate element whereby said one ends of said second and third elongate elements may be connected to supports at different distances apart, said second and third elongate elements being bendable at different points of their lengths to adjust the fan distance from the rotary ventilator.

3,952,639

LOUVER ASSEMBLY

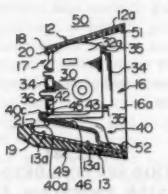
Tetsuo Nobata, c/o Universal Climb Co., Ltd., 6-6, Horita-dori, Mizuho, Nagoya, Aichi, Japan

Filed Dec. 30, 1974, Ser. No. 537,419

Claims priority, application Japan, Sept. 26, 1974, 49-115934

Int. Cl.² F24F 7/00

U.S. Cl. 98—110 **3 Claims**



1. A louver assembly for attachment to the airflow outlet of an air conditioner system, said assembly comprising:

a casing surrounding said airflow outlet and having at least one airflow opening;

adjustable louver means rotatably mounted to said casing within said airflow opening for rotation about a horizontal axis to adjust and direct the flow of air flowing out of the outlet; and

closure means pivotally attached at one end to the lower portion of the louver means for movement with the rotation of the louver means and cooperating with the lower wall of the casing, for blocking the flow of air under the louver and forcing the air to exit from the outlet only through the louver means, and for completely closing the airflow opening when the louver means is rotated upward.

3,952,640

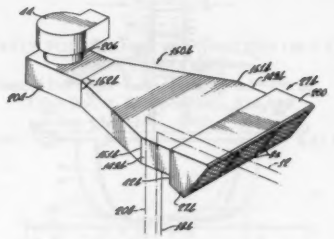
APPARATUS AND METHOD FOR EXTRACTING GREASE AND SMOKE, AND METHOD OF INSTALLING THE SAME

Irvin R. Kuechler, San Bernardino, Calif., assignor to Vent-Cair, Inc., San Bernardino, Calif.

Continuation-in-part of Ser. No. 336,970, March 1, 1973, abandoned, and a continuation-in-part of Ser. No. 497,690, Aug. 15, 1974. This application Sept. 26, 1974, Ser. No. 509,555

Int. Cl.² F23J 11/00

U.S. Cl. 98—115 K **8 Claims**



1. Apparatus for exhausting fumes from a space above a cooking appliance in a room in a restaurant, which comprises:

a. filter means adapted to be mounted above a cooking appliance in a room in a restaurant, and adapted to remove grease from the air and fumes passes through said filter means,

said grease filter means being of a type which effects both impingement and centrifugal filtering actions,

b. means to effect flow of a curtain of air across a space above said cooking appliance and toward said filter means,

said air curtain containing fumes from said cooking appliance,

c. means to create a relatively large-diameter vortex of air and fumes above said air curtain,

said vortex containing air and fumes from said curtain and which deflect off said filter means,

d. blower means to exhaust air and fumes to the exterior of said room, and to effect forced supply of at least air to said air curtain without depleting said room of major amounts or air, and

e. means to conduct air and fumes from said filter means to said blower means,

said last-named means comprising means to define a plenum chamber located on the opposite side of said filter means from said cooking appliance,

one major wall portion of said plenum chamber being formed by said grease filter means,

said last-named means further comprising means to define extended plenum chamber means which greatly extends said plenum chamber,

said extended plenum chamber means extending sufficiently far from said grease filter means that the velocity of flow through said grease filter means is substantially uniform across the entire width of the apparatus.

3,952,641

BEVERAGE BREWER APPARATUS

Charles J. Vitous, Berwyn, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed Jan. 27, 1975, Ser. No. 544,488

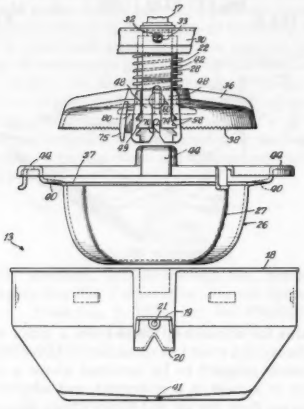
Int. Cl.² A47J 31/00

U.S. Cl. 99—295 **14 Claims**

1. In a beverage brewer having a brewing receptacle for holding bagged charges of beverage forming material, and

means for providing brewing liquid to said receptacle for treating the beverage forming material to brew a desired beverage therein, said liquid providing means including a delivery element defining a surface through which the liquid is delivered into the receptacle, the improvement comprising

means for selectively arranging the brewer to accommodate any one of a plurality of different volume bagged charges for brewing corresponding different quantities of beverage defined by means for mounting the receptacle below



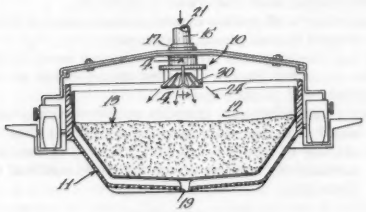
said liquid providing means surface in any one of a plurality of preselected different positions to cause each corresponding one of said different volume bagged charges selectively disposed in said receptacle to be urged against said surface with less than a preselected maximum pressure to preclude rupture of the bagged charge while providing good sealed contact of the bagged charge with said surface during delivery of the brewing liquid thereto by said liquid providing means.

3,952,642

LIQUID DISTRIBUTOR

Charles J. Vitous, Berwyn, Ill., assignor to Cory Food Services, Inc., Chicago, Ill.

Filed Nov. 4, 1974, Ser. No. 521,367
Int. Cl.² A47J 31/00
U.S. Cl. 99—300 **15 Claims**



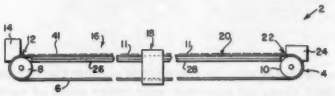
1. A liquid distributor for absorbing kinetic energy from a downwardly directed liquid stream and guiding the liquid therefrom in a distributed plurality of divergent paths to a subjacent receiver, said distributor comprising: wall means defining a flat surface having a center portion; a frustoconical element extending laterally outwardly from said wall means defining a plurality of divergent channels; and means for supporting the wall means and frustoconical element with said center portion of said flat surface in transversely extending centered relation to a downwardly directed liquid stream for absorbing kinetic energy therefrom, said flat surface having a lateral extent substantially greater than the cross section of the liquid stream, said supporting means being disposed intermediate said channels whereby said channels may guide liquid falling from the periphery of said flat wall surface into a distributed plurality of paths substantially without interference by said support means.

3,952,643

APPARATUS FOR COOKING FRENCH TOAST AND THE LIKE

Robert Wolfelsperger, Fairfield, and Richard J. Bozzo, Wyckoff, both of N.J., assignors to Sandco Limited, Ottawa, Canada

Filed Mar. 11, 1974, Ser. No. 449,703
Int. Cl.² A47J 37/06
U.S. Cl. 99—337 **20 Claims**



1. In a system for cooking individual food products, the combination of an endless belt having a product-carrying run with a product-supporting surface upon which the product is carried from a product-receiving station to a product-discharge station, means to deposit product portions on said surface in a predetermined relationship at said product-receiving station, inverting means positioned generally intermediate said stations and adapted to invert the product portions within a product-inverting zone, heating means to subject the product portions to cooking upon one side when upstream from said inverting means and upon the other side when downstream from said inverting means, said endless belt having indicating means spaced longitudinally therealong, first detector means at said product-receiving station which is responsive to moment thereby of said indicating means and which controls the positioning of said product portions upon said belt, second detector means upstream from said product-inverting zone which is responsive to movement thereby of said indicating means and which controls said inverting means, said first detector means being utilized to determine the relative position of each product portion longitudinally of said belt and said second detector means acting in response to the arrival of each product portion at said product-inverting zone to operate said inverting means.

3,952,644

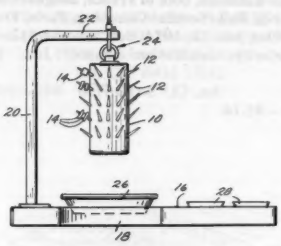
FOOD SERVING DEVICE

George A. Wales, 1519 S. Andrews Ave., Fort Lauderdale, Fla. 33316

Filed Apr. 30, 1974, Ser. No. 465,559
Int. Cl.² A47J 37/04
U.S. Cl. 99—419 **7 Claims**

1. A table-top food serving device from which a diner may be served individual pieces of food each of which is maintained in a heated condition, said device comprising: an inert body capable of being heated and constructed of high heat-absorbing and heat-radiating material, said body having a plurality of food-holding skewers fixedly secured to and extending from the outer surface of said body, said skewers being arranged side by side and one above another and each of said skewers being of a size to receive at least one bit-size piece of food, the mass and heat-absorbing properties of said body and said skewers being sufficient, when said body has been heated, to maintain pieces of food on said skewers in a

heated condition by conduction and radiation from said body and said skewers; and means for supporting said body in an



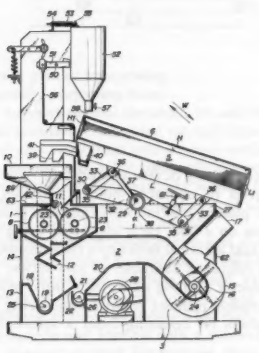
upright suspended position in which said skewers retain pieces of food placed thereon.

3,952,645

GRAIN HULLING AND SORTING APPARATUS

Toshihiko Satake, Saijo-cho, 2-38, Nishihon, Kamo, Hiroshima, Japan

Filed Dec. 2, 1974, Ser. No. 528,687
Int. Cl.² B02B *3/04*
U.S. Cl. 99—524 **5 Claims**



1. A grain hulling and sorting apparatus comprising:

a supporting frame box having two longitudinal side walls and two transverse end walls, said longitudinal walls being longer in length than said transverse end walls;

a hulling chamber provided in the upper portion of said frame box, adjacent to one of said transverse walls;

hulling means provided in said hulling chamber for hulling the grain;

winnowing means contained in said frame box, said winnowing means operatively connected to said hulling chamber;

a first hopper located above said hulling chamber for supplying grain thereto;

sorting means containing a single sorting pan moveably fitted above said frame box for sorting hulled and unhulled grain;

a second hopper located above said sorting means for supplying grain thereto;

conveyor means located adjacent to said frame box and operatively connected to said hulling chamber for upwardly transferring said hulled and unhulled grain to said second hopper through a discharge opening at the upper end of said second hopper; and

oscillating means connected between said sorting means and said frame box for obliquely oscillating said sorting means parallel to said longitudinal side walls of said frame box.

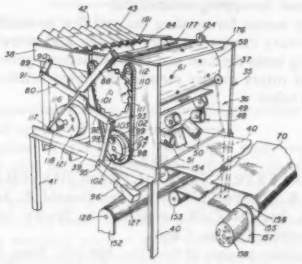
5. Apparatus as claimed in claim **1,** wherein said second hopper is connected to the discharge opening of said conveyor means, said second hopper being movable upwardly and downwardly in accordance with the amount of grain stored therein and operatively connected with said first hopper so that the amount of grain to be supplied to the hulling chamber can be controlled according to the amount of grain supplied to and stored in said second hopper.

3,952,646

APPARATUS FOR DECAPPING THE STEMS OR CAPS OF STRAWBERRIES

Evan Leban, 7266 River Road, Sodus, Mich. 49126

Filed Dec. 9, 1974, Ser. No. 530,980
Int. Cl.² A23N *15/02, 15/04*
U.S. Cl. 99—639 **41 Claims**



2. Strawberry decapping apparatus for decapping or cutting the stems or caps from the bodies of strawberries comprising:

a. a supporting frame;

b. decapping means mounted on the said supporting frame for decapping or cutting the stems or caps from the bodies of the strawberries;

c. a first rotary carrier means rotatably mounted on the said supporting frame and including

1. a first generally cylindrical rotary carrier member rotatably mounted on the said supporting frame and having

a. a hollow interior;

b. an outer peripheral surface; and

c. a plurality of strawberry conveying units mounted on the said outer peripheral surface of the said generally cylindrical first rotary carrier member and each adapted to receive and to convey a strawberry and each having

1. an open radially inner or lower end; and

2. an open radially outer or upper end;

d. a second rotary carrier means including

1. a second generally cylindrical second rotary carrier member rotatably mounted on the said supporting frame above the said first generally cylindrical rotary carrier member and having

2. a hollow interior;

e. strawberry feeding means mounted on the said supporting frame for feeding strawberries one at a time into each of the said strawberry conveying units through the said open radially outer or upper end thereof;

f. air pressure supply means for supplying air under pressure sequentially from the hollow interior of the said first generally cylindrical rotary carrier member into each of the said strawberry conveying units thereon through the said open radially inner or lower end thereof against the body of a strawberry disposed in one of the said strawberry conveying units to initiate movement of the straw-

berry radially outwardly in one of the said strawberry conveying units toward and into engagement with the said second generally cylindrical rotary carrier member;

g. vacuum means for applying vacuum sequentially from the said hollow interior of the said second generally cylindrical rotary carrier member to the said open radially outer or upper end of each of the said strawberry conveying units;

h. the said air pressure supply means and the said vacuum means coacting sequentially to move the strawberries in the said strawberry conveying units outwardly therein toward and into engagement with the said second generally cylindrical rotary carrier member while at the same time positioning and holding the strawberry in the said strawberry conveying unit in position to enable the strawberry to engage the said decapping means and to enable the said decapping means to cut or decap the stem or cap from the body of the strawberry as the strawberry is moved by the coaction of the said first generally cylindrical rotary carrier member and the said second generally cylindrical rotary carrier member into engagement with the said decapping means; and

i. power means for rotating the said first generally cylindrical rotary carrier member and the said strawberry conveying units thereon and the said second generally cylindrical rotary carrier member in timed relationship with each other.

3,952,647

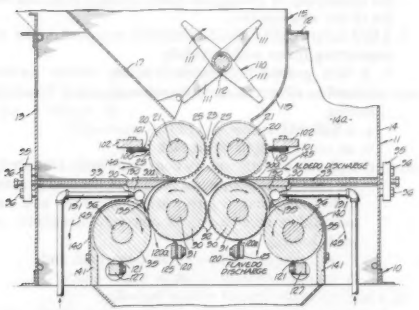
ROLL FOR EXTRACTING OIL FROM SHAVED FLAVEDO

Franklin K. Holbrook, Whittier, and Donald R. James, West Covina, both of Calif., assignors to Brown International Corporation, Covina, Calif.

Continuation-in-part of Ser. No. 398,686, Sept. 19, 1973, abandoned. This application Sept. 13, 1974, Ser. No. 505,541

Int. Cl.² B30B 9/02

U.S. Cl. 100—98 R **3 Claims**



1. In a device for extracting oil from the peel of citrus fruit, the device including a metallic roll cooperating with a cleated drum and a knife to separate the albedo from the flavedo of the citrus peel, the roll also cooperating with a knurled roller to extract oil from the flavedo, the improvement comprising: a series of circumferential closely spaced sharp, knife-like, circular fins on the periphery of the roll cooperating with the knurled roller to puncture oil cells in the flavedo, said fins having smooth flanks connected by smooth annular grooves, and a flexible non-metallic stationary wiper blade having an edge in resilient contact with said fins.

3,952,648

CHARACTER PRINTING DEVICE

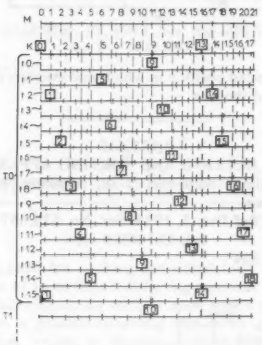
Jacques Sery, Vitry (Seine), and Serge Andre Emmanuel Couture, Plessis-Robinson, both of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Jan. 18, 1974, Ser. No. 434,612

Claims priority, application France, Jan. 19, 1973, 73.01993

Int. Cl.² B41D 7/08

U.S. Cl. 101—93.14 **15 Claims**



1. A character printing device comprising:

successive series of character-holder matrices, regularly spaced and passing continuously opposite possible printing positions on a line, each character being marked in any one of said identical series by a rank number N counting from a reference character of said series;

selective character printing units, these units being situated opposite possible printing positions and being marked by order numbers N′ counting from a reference printing unit;

a recording memory to record data concerning the characters to be printed on a line and the order number of these characters on the line;

a coincidence detection unit to detect coincidences which appear between the print control units and the characters as the latter pass by, these coincidences appearing by successive groups, in the course of scan periods T_n where n represents the numbers of these periods, each of them being the interval of time that separates two coincidences of characters with a predetermined printing unit; and

a printing-unit control system for said printing units which is connected to the outputs of said recording memory and to the outputs of said coincidence detection unit, and which permits the printing of a character of rank N by a printing unit of order number N′ in the course of a scan period T_n in such manner that the relation

$$n = N - N_o, \text{ for } N > N_o, \text{ and}$$

$$n = C + N - N_o, \text{ for } N_o > N$$

is satisfied, N_o representing the rank of the character that would be printed by this same unit of number N′ in the course of an initial scan T_o and C representing the number of different characters in said series.

3,952,649

CHECK PRINTER HAVING RIBBON CARTRIDGE

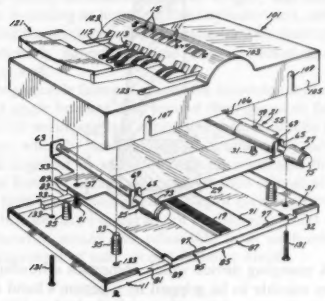
Joseph K. Dikoff, No. 4 Privateer, Apt. 3, Marina Del Rey, Calif. 90291

Filed Apr. 25, 1974, Ser. No. 463,961

The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.

Int. Cl.² B41J 17/32

U.S. Cl. 101—100 7 Claims



1. A check printer comprising:

a horizontally projecting base;

a check support surface mounted on said base;

a chassis removably mounted on said base for movement toward and away from said support surface, said chassis being formed with a flat underside cooperating with said base to form a straight pathway leading from one side to the other of said check support surface and including ink ribbon cartridge mounting means;

a plurality of printing wheels disposed over said support surface and mounted on said base in side-by-side relationship for independent rotation thereof, said wheels being formed in their peripheries with printing members;

an ink ribbon cartridge including a flat plate underlying said flat underside and formed with a window overlying said check support surface for passage therethrough of the peripheries of said wheels and including two pairs of upturned ears formed on opposite ends thereof with the ears of said pairs being disposed at opposite sides of said plate, said ears including reel mounting means, said cartridge further including feed and take-up reels mounted on their opposite ends on said reel mounting means and an ink ribbon leading from said feed reel across said pathway to said take-up reel and advance means on said take-up reel for rotating said take-up reel to advance said ribbon;

fastening means for removably mounting said cartridge to said cartridge mounting means;

an actuating handle engaging said chassis for depression thereof to press the periphery of said wheels into engagement with said ribbon to, in turn, press it through said window and against a check on said check support surface; and

a cover removably mounted on said base to cover said chassis whereby said take-up reel may be advanced incrementally to position fresh ribbon under said wheels and when the ink in said ribbon becomes depleted said cover and chassis may be removed, said fastening means unfastened and said cartridge removed as a unit and replaced with a replacement cartridge.

3,952,650

DOCTOR-BLADE HOLDER WITH CLEANING MEANS

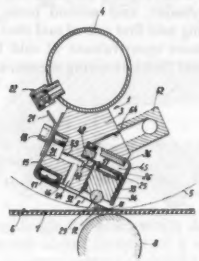
Andre Lotte, Mulhause, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed Sept. 23, 1974, Ser. No. 508,340

Claims priority, application France, Sept. 21, 1973, 73.34033

Int. Cl.² B41F 15/42, 35/00, 41/00

U.S. Cl. 101—120 6 Claims



1. An apparatus for use with a printing machine having a screen, said apparatus comprising:

an elongated doctor-holder including a body and a color supply unit secured to said body for supply of colorant onto the outer surface of said body,

a doctor including an elongated strip of thin flexible material having an inner face, an outer face, a longitudinal free wiping marginal portion to be operably engaged at said outer face against the screen of said printing machine and an opposite longitudinal marginal securing portion, said colorant flowing on said outer surface of the body to the space between the outer face of the doctor and the screen,

holding means on said doctor-holder for firmly holding said marginal securing portion of said doctor,

resilient means in said doctor-holder for applying pressure on said longitudinal free wiping marginal portion of said doctor to urge the same against the printing screen during a printing process,

said body having a longitudinal conduit communicating with said inner face of said doctor and with said resilient means,

and union means carried by said doctor-holder and communicating with said longitudinal conduit for connection to a source of cleaning pressure fluid to supply such cleaning pressure fluid to said inner face of the doctor and said resilient means via said conduit to clean accumulated colorant thereat.

3,952,651

SHEET FEEDING APPARATUS FOR PRINTING MACHINES

Hans Bernhard Bolza-Schünemann, Wurzburg, Germany, assignor to Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany

Filed Mar. 4, 1974, Ser. No. 447,698

Claims priority, application Germany, Mar. 16, 1973, 2313150

Int. Cl.² B41F 21/04

U.S. Cl. 101—242 4 Claims

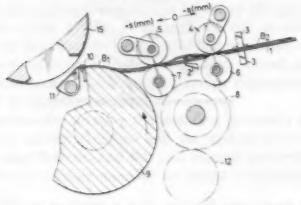
1. Sheet feeding apparatus for printing presses for sequentially feeding sheets to the constantly rotating impression cylinder of a printing press, the impression cylinder having front stops and sheet grippers, said sheet feeding apparatus including in combination:

a sheet feeding table having front register lays, said front register lays being vertically reciprocatable cyclically

with rotation of the impression cylinder to register sheets thereat;

a first push type conveying means positioned adjacent the feed table and in advance of the feed table's front register lays, said first push type conveyor being operable intermittently to advance a first one of said sheets from its registered position against the front register lays along the feed table toward the impression cylinder; and

a second push type conveying means positioned adjacent the feed table and between the front register lays and the impression cylinder, said second push type conveying means receiving said first one of said sheets from said first conveying means upon release of said first one of said sheets from said first conveying means, said second conveying means intermittently conveying said first one of said sheets along the feed table to the sheet grippers of the impression cylinder at a speed higher than the peripheral speed of the impression cylinder, said second conveying means releasing said first one of said sheets to the impression cylinder grippers as said first conveying means advances a second one of said sheets from its registered position against said front register lays toward said second conveyor, said front register lays being positioned beneath said feed table to lift a trailing edge of said first sheet to permit said second sheet to move thereunder, whereby the first and second conveying means sequentially feed sheets along the feed table to the impression cylinder.



3,952,652

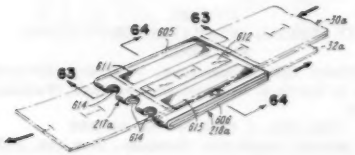
LABEL PRINTING AND APPLYING APPARATUS

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Division of Ser. No. 312,454, Dec. 6, 1972, which is a continuation-in-part of Ser. No. 208,035, Dec. 8, 1971, abandoned. This application Jan. 10, 1975, Ser. No. 540,051

Int. Cl.² B41F 1/06, 1/00; B41J 11/08, 11/20

U.S. Cl. 101—316 4 Claims



1. Printing apparatus, comprising: a printing platen comprising a pair of spaced apart plates having aligned sets of openings, flexible resilient material between the plates and in the sets of openings to provide flexible resilient platen sections, and a print head having a plurality of printing members cooperable with the respective platen sections, and support means in contact with the plates but not with the flexible resilient platen sections, the platen sections being supported solely by the pair of plates, thus enabling the platen sections to yield independently of each other during printing.

3,952,653

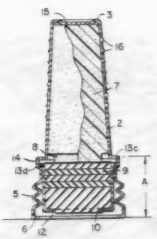
STAMP DEVICE

Donald L. McFarland, Santa Barbara, Calif., assignor to Fairfield Marking Products, Inc., Greenwich, Conn.

Filed Mar. 24, 1975, Ser. No. 561,319

Int. Cl.² B41K 1/02, 1/38

U.S. Cl. 101—327 3 Claims



1. A stamping device which comprises a housing having a portion suitable to be gripped by a person's hand one end of which is closed and the other end of which is integral with a shoulder portion which is integral with a bellows portion having a mating ridge where the bellows joins the shoulder portion and which terminates in an open end, a rigid member constructed of the same general configuration as the gripping portion of the housing and having a projection extending from one surface thereof, said rigid member being inserted into the housing, an end member having a retaining lip around one surface thereof and having protuberances positioned on a second surface, a self-inked stamp totally disposed within said end member so that the word or words to be stamped are in contact with that portion of the end member having the retaining lip, a depressible member disposed within said end member on top of said self-inked stamp, said end member containing said self-inked stamp and said depressible member being fitted into the bellows portion of said housing so that the protuberances on the end member contact the mating ridge between said bellows and said shoulder to retain said end member within said housing in a removable manner.

3,952,654

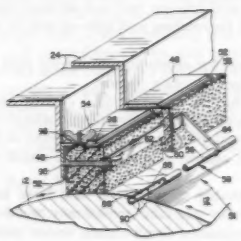
AUTOMATIC BLANKET WASH-UP SYSTEM

Robert E. Evans, 1205 Second Ave. S., Clinton, Iowa 52732

Filed Apr. 8, 1974, Ser. No. 459,096

Int. Cl.² B41L 41/00, 41/06

U.S. Cl. 101—425 5 Claims



1. A cleaning attachment for a cylindrical surface, such as a blanket cylinder in an offset printing press, comprising:

an elongated frame adapted for mounting adjacent said cylindrical surface parallel to the axis of said cylinder;

a sponge;

actuating means mounted on said frame to support and move said sponge into engaging pressure wiping relationship with said cylindrical surface to form a presssure nip;

a single elongated spray tube means supported adjacent said sponge just upstream of said pressure nip and substantially parallel thereto, said spray tube means having a plurality of orifices directed to dispense a spray of said cleaning solvent adjacent said pressure nip against both said sponge and said cylindrical surface;

an angle bracket for directly supporting and stabilizing said sponge along substantially its full length, said actuating means including at least one fluid cylinder unit, and fluid pressure means to operate said cylinder unit, said cylinder unit directly supporting said angle bracket and said sponge; and

first disengageable fastener means for mounting said sponge to said angle bracket; and second disengageable fastener means for mounting said spray tube means directly to said sponge, whereby said sponge and said spray tube are moved together by said cylinder unit when said first and second fastener means are engaged, said sponge and said spray tube means being releasable for cleaning from said angle bracket as an integral unit by disengagement of said first fastener means and releasable from each other by disengagement of said second fastener means.

3,952,655

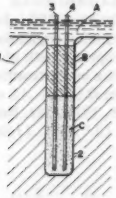
UNDERWATER BLASTING METHOD AND EXPLOSIVES AND DEVICES USED THEREIN

Masao Kusakabe; Shuzo Fuziwara, both of Hiratsuka, and Kazuo Shiino, Odawara, all of Japan, assignors to Director-General of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 26, 1974, Ser. No. 445,911

Int. Cl.² F42D *1/00*

U.S. Cl. 102—23 **5 Claims**



1. A method of blasting underwater objects to be removed by the use of a water soluble fluid explosive, characterized by the successive steps of injecting an inert fluid immiscible with both the fluid explosive and water and having an intermediate specific gravity between the two into a blasting hole in the object to be blasted, injecting a water soluble fluid explosive having a specific gravity greater than water to form a layer of the inert fluid on the fluid explosive thereby enabling the fluid explosive to be loaded into the blasting hole in such manner that the fluid explosive is isolated from water, and thereafter detonating the fluid explosive thus loaded.

3,952,656

DEVICE AND PROCESS

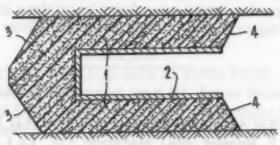
Richard Fox, Rosanna; David Gilbert Hay, Balaclava, and Ronald John Herniman, North Balwyn, all of Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited, Melbourne, Australia

Continuation of Ser. No. 181,161, Sept. 16, 1971, abandoned. This application Sept. 5, 1973, Ser. No. 394,479

Claims priority, application Australia, Sept. 21, 1970, 2604/70; Apr. 13, 1971, 4561/71

Int. Cl.² F42B *3/20*

U.S. Cl. 102—30 **3 Claims**



1. A stemming device for holes which device comprises a generally cylindrical object formed of a solidified material selected from a group consisting of natural rubber, synthetic rubbers and plastic materials having a generally circular top and bottom and a lateral surface corrugated to form a series of frustrated cones, a series of O-rings placed in the corrugations of the lateral surface, said device being capable of forming a seal in conjunction with the wall of a hole and being characterized in that it prevents, minimizes or substantially retards the flow of flowable, pourable or pumpable material from said hole when said device is moved in the direction opposite that of insertion whereby the O-rings expand and form a seal between the device and the wall of said hole.

3,952,657

RIFLE CARTRIDGE

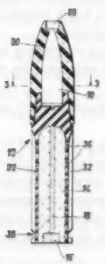
Hans-Joachim Kaltmann, Dusseldorf, Germany, assignor to Rheinmetall GmbH, Dusseldorf, Germany

Filed Apr. 11, 1974, Ser. No. 460,137

Claims priority, application Germany, Apr. 21, 1973, 2320399

Int. Cl.² F42B *5/02*

U.S. Cl. 102—38 **4 Claims**



1. A rifle cartridge for firing in a weapon having a barrel, said cartridge comprising:

an elongate projectile having a diameter less than the caliber of said barrel;

a shell of plastic material affixed to said projectile and having a diameter substantially corresponding to the caliber of said barrel, said shell comprising a tubular rear portion extending rearwardly of said projectile and a forward portion substantially enveloping said projectile and forming a sabot therefor, said rear and forward portion being interconnected, said shell being formed with weakened zones enabling separation of said projectile

therefrom upon emergence of the cartridge from the barrel, said forward portion being formed with an opening at a leading end of said projectile enabling air to enter between said projectile and said forward portion, said forward portion and said rear portion being each formed with a plurality of angularly spaced radial ribs defining said weakened zones between them, said rear portion being provided with orifices communicating between the interior of said rear portion and the exterior thereof between the ribs of said rear portion to enable pressure equalization across the wall of said rear portion upon ignition of said charge; and

a propellant charge received in said rear portion and adapted to ignite upon firing to produce propellant gases driving said projectile and said shell from said barrel.

3,952,658
ELECTRICALLY FIRED SUPERIMPOSED PROJECTILE

Howard F. Broyles, 4841 Maryland Ave., La Crescenta, Calif. 92014

Division of Ser. No. 773,691, Sept. 26, 1968, Pat. No. 3,854,231. This application Dec. 7, 1973, Ser. No. 422,512 The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.

Int. Cl.² F42B 7/02

U.S. Cl. 102—40 **8 Claims**

1. A cartridge for an electrically fired weapon system comprising;

an elongated casing including an end opening;

a plurality of individual superimposed charges in said casing, each positioned to be propelled in sequence through said end opening; each of said superimposed charges comprising projectile means and a propellant charge;

detonator means for each of said charges and positioned to detonate and propel each projectile means in sequence through said end opening;

electrical contact means extending longitudinally along said casing in energizing relationship with respective detonator means;

including fusible link means short circuiting at least one of said squib means;

said fusible link means positioned to be fired by detonation of the charge preceeding the charge associated with said squib means of the next succeeding charge; and

further including pressure responsive switch means positioned within the wall of said casing in detonation pressure communication with at least one of said charges.

3,952,659
FLATTENED SPHERICAL SHOT

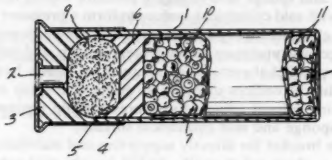
Alphonse J. Sistino, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed June 20, 1974, Ser. No. 481,074

Int. Cl.² F42B 7/04, 11/00

U.S. Cl. 102—42 R **7 Claims**

6. A shotshell including a casing, a primer, a powder charge, a wad structure, pellets, and a closure, the improvement comprising the pellets in the shot column being formed with six equally spaced, substantially flattened faces entirely surrounded by spherical surfaces so that the randomly loaded shot column in said shotshell contains from 12 to 16 per cent more shot pellets than a shotshell loaded with spherical pellets of the same weight.



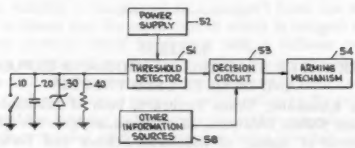
3,952,660
FUZE SAFING AND ARMING DEVICE UTILIZING PROPELLANT IONIZATION

Harry J. Davis, Wheaton, and Philip F. Ingersol, Silver Spring, both of Md., assignors to The United states of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 17, 1974, Ser. No. 489,306

Int. Cl.² F42C 11/00, 15/40

U.S. Cl. 102—70.2 R **10 Claims**



1. In combination with an electrically actuated arming mechanism for a fuze, an electrical safety device comprising:

a. an ionization sensor;

b. a threshold detector connected to said sensor; and

c. a decision circuit connected to said detector.

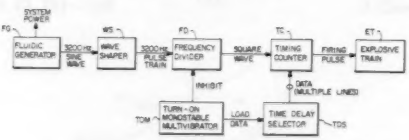
3,952,661
FLUIDIC FUZE

Frank Vrataric, Jr., Wheaton, Md.; James E. Forrest, Jr., Alexandria, Va.; Carl J. Campagnuolo, Potomac, and Francis E. Blodgett, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 25, 1974, Ser. No. 491,897

Int. Cl.² F42C 11/00

U.S. Cl. 102—70.2 R **9 Claims**



1. A time fuze for firing an explosive train in a projectile at a predetermined time after said projectile is fired comprising in combination:

a. a fluidic generator means for generating an electrical signal in response to the flow of ram air into said fluidic generator means, said electrical signal having a characteristic resonant frequency;

b. electrical circuit means coupled to said fluidic generator means for generating an output pulse in response to the

receipt of a selected number of cycles of said electrical signal;

c. time delay selection means coupled to said electrical circuit means for controlling said selected number of cycles to which said circuit means responds to generate said output pulse; and

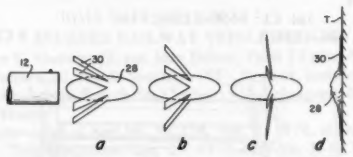
d. detonating means for receiving said output pulse and for firing said explosive train in said projectile in response thereto.

3,952,662

NON-LETHAL PROJECTILE FOR RIOT CONTROL

William D. Greenlees, Rte. No. 1, Box 711-L, Accokeek, Md. 20607

Filed May 29, 1974, Ser. No. 474,472
Int. Cl.² F42B 11/02
U.S. Cl. 102—92.7 8 Claims



1. A non-lethal projectile adapted to be fired from a gun barrel comprising:

a central, pliant, deformable, non-rupturable body having a plurality of flexible finger-like arms integral therewith and extending rearwardly, each of said arms being affixed to said body only at the end which is nearer the front of said body for extension transversely to said body after firing of said projectile,

said body flattening out upon impacting an object, so that impact force of said projectile is reduced,

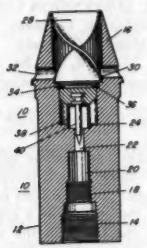
said arms swinging forward to strike said object at a time slightly later than said body, thereby further absorbing said impact and spreading said impact over a large area whereby said projectile does not penetrate said object.

3,952,663

DIFFUSER

John J. Forst, 14 Round Top Road, Warren, N.J. 07060, and Kenneth L. Willison, 16 Woodland Ave., Hamburg, N.J. 07419

Filed June 21, 1974, Ser. No. 481,927
Int. Cl.² F42C 1/00
U.S. Cl. 102—73 R 1 Claim



1. An impact sensitive fuze for explosive missiles comprising:

a truncated conically shaped body having a longitudinal axis and an axial bore;

said body having a plurality of apertures in its base extending transversely of said axial bore and communicating with said bore;

means for detonating said missile mounted in said bore; and

barrier means, mounted in said bore intermediate the front end of said bore and said detonating means, adapted to provide an effective cover for said detonating means, thereby preventing moving objects from striking said detonating means, while permitting objects, such as droplets of water, to pass through said barrier means in directions inclined to the longitudinal axis;

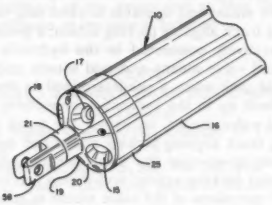
wherein said barrier means is in the form of a twisted plate having a twist angle of at least 180°.

3,952,664

ROCKET NOZZLE MULTI FUNCTION

Joseph A. Schmidt, Ridgecrest, and W. James Stone, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 10, 1974, Ser. No. 478,009
Int. Cl.² F42B 13/56, 15/06
U.S. Cl. 102—89 1 Claim



1. A rocket motor assembly having a cylindrical casing containing a rocket propellant for use with a rocket motor that is utilized for towing a load during powered flight by means of a tow line, the improvement comprising:

an integral removable cylindrical end portion having a generally conical portion with a base and an apex, a boss portion on the apex end, a generally cylindrical annular portion of a lesser diameter than the major diameter of the conical base section extending transversely outwardly from a plane parallel with the base of said conical portion to provide a protrusion that slidably fits within a rocket motor casing;

a circumferential flange portion formed by the intersection of the base of said conical section and an outer wall of said cylindrical annular portion;

four nozzle apertures opening on a tapered surface of said conical portion and extending through said conical portion so as to be in direct communication to an interior part of said cylindrical annular portion;

an igniter chamber formed by an axial bore extending a substantial distance into said boss portion;

igniter means adapted to fit in said igniter chamber;

shackle means connected to said igniter means for connecting said tow line to said rocket motor;

propellant booster container fastened within and concentric with the center of said cylindrical annular portion;

sealing means positioned on an outer circumferential surface of said cylindrical porton; and

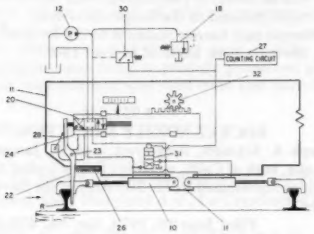
a locking groove on an outer circumferential surface of said cylindrical annular portion for rigidly fastening said cylindrical end portion to an interior portion of a rocket motor casing by means of a locking wire.

3,952,665

DEVICE FOR LATERALLY DISPLACING A RAILROAD TRACK

John Kenneth Stewart, and Helmuth von Beckmann, both of Columbia, S.C., assignors to Canron, Inc., Phillipsburg, N.J.

Filed Mar. 28, 1975, Ser. No. 562,923
Int. Cl.² E01B 33/02
U.S. Cl. 104—8 8 Claims



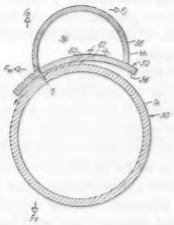
5. A control system for the cycling of a railroad track aligning jack comprising an hydraulic pressure source; hydraulic connections between jack and source; a valve means in said connections; rail position feeler means operatively connected to said valve means and operable to close said valve means to terminate a track aligning jacking action; a pressure sensitive means operatively connected in the hydraulic connections between said valve means and said source and operable to exhaust said jack when a predetermined hydraulic pressure has been built up in the hydraulic connections between the source and valve means, to permit the track to react to a preceeding track aligning jacking action and move from said feeler means to re-open the valve means and reinstitute a track aligning jacking action; and means for monitoring the number of operations of the valve means to control the number of jacking actions in an aligning operation.

3,952,666

VEHICULAR TRANSPORTATION SYSTEM

Herbert E. Gladish, 724 Echo Drive, Ottawa, Ontario, Canada (K1S 1P3)

Filed Nov. 7, 1974, Ser. No. 521,594
Claims priority, application Canada, Nov. 15, 1973, 185869
Int. Cl.² B61B 13/08
U.S. Cl. 104—23 FS 7 Claims



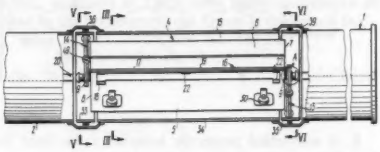
1. A vehicular transportation system comprising a vehicle for guided longitudinal movement along a prepared track having a transversely curved support surface, said vehicle comprising body means, propulsion means, and at least two longitudinally spaced apart vehicle support members having flexible connection with said vehicle for limited articulation relative thereto, each of said support members having an outer surface transversely curved to be complementary with said track support surface, one of said curved surfaces being generally concave in cross-section, the other being generally convex in cross-section, the two surfaces converging laterally, the generally concave surface being provided with nozzle means asymmetrically disposed substantially on one side of the longitudinal axis thereof for projecting fluid at an angle thereto to form a wedge of supporting fluid diminishing in thickness in the direction of convergence between said support surface and said outer surfaces whereby said support members are supported above said track by said wedge.

3,952,667

PNEUMATIC LOAD TRANSPORTATION SYSTEM

Pavel Vasilievich Kovanov, B.Bronnaya, 19-21, kv. 23; Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261, and Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61, all of Moscow, U.S.S.R.

Filed Apr. 28, 1975, Ser. No. 572,164
Claims priority, application U.S.S.R., May 14, 1974, 2023614
Int. Cl.² B65G 51/04; F16C 33/10
U.S. Cl. 104—138 R 9 Claims



1. A pneumatic load transportation system comprising: receiving and dispatching stations; a pipeline interconnecting said receiving and dispatching stations; guides rigidly fixed opposite to each other to the inner side walls of said pipeline substantially in a diametrical plane along the entire length thereof; containers in said pipeline; an annular space between each of said containers and said pipeline; a leading seal mounted on each container at the forward end side thereof in the direction of movement of said containers, said seal closing the lower half of said annular space; a trailing seal mounted on each container at the rear end side thereof in the direction of movement of said containers, said seal closing the upper half of said annular space; through slots in said leading and trailing seals for the passage of said guides; longitudinally extending lateral seals which are made stiff and fixed to the opposite lateral sides of each of said containers substantially in a diametrical plane between said leading and trailing seals; said longitudinally extending lateral seals of each of said containers being supported by said guides and serving as bearing supports for sliding of said containers; a source providing a flow of gas in said pipeline for moving said containers therealong.

3,952,668

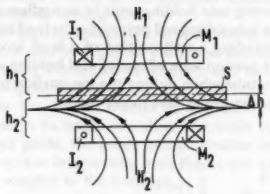
ELECTRODYNAMIC SUSPENSION GUIDANCE SYSTEM

Laxmikant Urankar, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 24, 1974, Ser. No. 517,589
Claims priority, application Germany, Nov. 16, 1973, 2357325
Int. Cl.² B61B 13/08
U.S. Cl. 104—148 SS 5 Claims

1. In an electrodynamic suspension guidance system for a track-bound moving vehicle which includes rows of vehicle mounted pairs of magnet coils the coils in each pair disposed horizontally one over the other with a gap between, the pairs disposed one behind the other in the travel direction and which magnet pairs cooperate with secondary conductor means, of a nonmagnetic electrically conductive material mounted to the roadbed and disposed in said gap, to form a zero flux system, which is self-controlling wherein the improvement comprises at least some of the magnet coil pairs arranged so that the upper magnet coil generates a magnetic

field which is stronger than the magnetic field generated by the lower magnet coil the difference being such as to cause the



distances between the reaction rail and the respective magnet coils to be approximately equal.

3,952,669

SNUBBED RAILWAY VEHICLE BOGIE

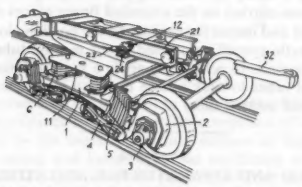
Andre E. Mauzin, 25, rue Jean Dolent, Paris 14 eme; Pierre P. Truffart, 70, rue de Sannois - (95), Ermont, and Ferdinand L. Tharel, 10 Square des Credos, (93), Epinay-sur-Seine, all of France

Continuation of Ser. No. 86,238, Nov. 2, 1970, abandoned. This application Apr. 23, 1973, Ser. No. 354,156

Claims priority, application France, Nov. 2, 1969, 69.37973

Int. Cl.² B61F *3/08, 5/08, 5/24, 5/30*

U.S. Cl. 105—171 **4 Claims**



1. A bogie for a railway vehicle having a bogie frame carrying axle boxes, which bogie also includes a resilient suspension having two stages namely: (a) a primary stage between said bogie frame and said axle boxes, said primary stage consisting of resilient chevron-shaped blocks of high vertical flexibility and transverse rigidity; and (b) a second stage between said bogie frame and the vehicle body, said second stage having reduced vertical flexibility and high horizontal flexibility, said secondary suspension stage being formed only from interleaved resilient blocks operating in compression, said blocks being distributed about an imaginary center of pivotal movement of said bogie with respect to said body and having an axis of compression which is slightly inclined with respect to said body so as to converge upwardly and to operate in shear to ensure transverse and rotational adjustment of said bogie and reduced inclination of said body on a curved track, and a device adapted to change the transverse characteristics of the second stage of the suspension in dependence upon the load, and said device comprising a rigid body stop fixed to said vehicle body and cooperating with a rigid bogie stop, the latter being coupled to said bogie frame vertically by means of a first set of resilient blocks and horizontally by means of a second set of resilient blocks, said resilient blocks mounted on said bogie frame, said rigid body stop and said rigid bogie stop having mutually cooperating oblique surfaces which are spaced apart when said vehicle is unloaded but engaged when said body is loaded, whereby any given transverse movement of said bogie causes greater compression of said second set of resilient blocks when said body is loaded than when it is unloaded.

3,952,670

RAILWAY VEHICLE PRIMARY SUSPENSIONS

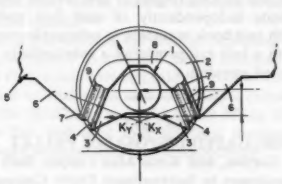
Reginald Harrison, Oadby, England, assignor to Dunlop Limited, London, England

Filed July 24, 1974, Ser. No. 491,245

Claims priority, application United Kingdom, Aug. 1, 1973, 36507/73

Int. Cl.² B61F *5/26*

U.S. Cl. 105—224.1 **5 Claims**



1. A railway vehicle including a body and a primary suspension comprising a downwardly inclined pair of longitudinally opposed springs of elastomeric material each mounted at their lower end upon an axlebox having an axle and supporting an axleset and adapted for connection at their other end to the vehicle body wherein the axis of the axleset is substantially vertically displaced from the plane of action of the resultant longitudinal stiffness of the suspension so that the effective longitudinal stiffness at the axle is reduced.

3,952,671

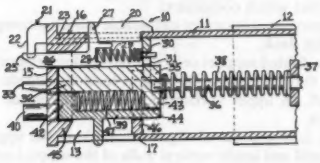
UNIVERSAL CROSSBAR HEAD FOR ENGAGING BELTRAILS

Emanuel Val Verde, Chicago, Ill., assignor to Transco Inc., Chicago, Ill.

Filed Feb. 5, 1975, Ser. No. 547,102

Int. Cl.² B60P *7/08, 7/16;* **B61D** *45/00, 49/00*

U.S. Cl. 105—498 **8 Claims**



1. A universal head structure for a crossbar of a freight-retaining system including belt rails mounted on opposite side walls of a load-carrying chamber having various different configurations requiring different connections between the head structure and the belt rails, wherein the improvement comprises

a. a hollow housing adapted to be connected to the end of an elongated crossbar,

b. said housing providing a substantially flat front wall extending perpendicularly to the longitudinal plane of the crossbar,

c. a pair of fixed hook members carried by said housing projecting frontwardly and downwardly from said front wall,

d. a first means slidably mounted in said housing and providing a portion movable through an opening in said front wall so as to cooperate with said hook members to releasably connect the crossbar to a belt rail providing a horizontal flange having vertically directed openings formed therein,

e. a second means slidably mounted in said housing providing a pair of locking fingers movable through openings in

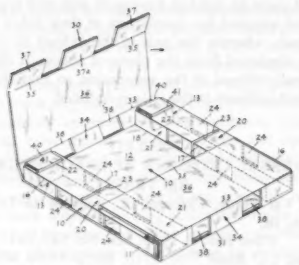
said front wall in a plane parallel to said first means beneath and outwardly of said hook members so as to cooperate independently of said first means with said hook members to releasably connect said crossbar to a belt rail having a raised retaining lip and a spaced angularly directed opening,

f. and a third means slidably mounted in said housing providing a pair of retaining pins movable through openings formed in said front wall in a spaced parallel plane with respect to said locking fingers of said second means so as to cooperate independently of said first and second means with said hook members to releasably connect the crossbar to a belt rail providing a substantially horizontally directed opening.

3,952,672
CORRUGATED DISPOSABLE PALLET

Robert Lewis Gordon, and Keith Alan Cooper, both of Monroe, N.Y., assignors to International Paper Company, New York, N.Y.

Filed Dec. 19, 1974, Ser. No. 534,467
Int. Cl.² B65D *19/34*
U.S. Cl. 108—56 **18 Claims**



1. A pallet which comprises:

a. a unitary inner structure of foldable material comprising

i. a flat deck,

ii. two folded support cells extending along opposite sides of the flat deck containing at least an outside vertical wall, an upper horizontal wall, and an inside vertical wall;

iii. at least one set of aligned slots along the upper horizontal and inside vertical walls of the support cells; and

b. a unitary outer structure of foldable material comprising,

i. a flat deck abutting the flat deck of the inner structure,

ii. two vertical walls extending from opposite edges of said flat deck and folded about the ends of said inner structure support cells,

iii. two flaps extending respectively from said vertical walls and folded along the upper horizontal support cell walls,

iv. two tuck flaps extending respectively from said flaps and inserted into said slots in said support cells.

3,952,673
AUTOMATIC METHOD AND APPARATUS FOR CLOSING THE TOE OF SEAMLESS HOSE

Yoshinobu Fukuyama, Kashiwara, Japan, assignor to Takatori Machinery Works, Ltd., Yamatotakada, Japan

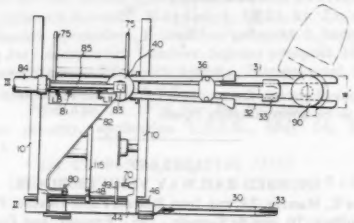
Division of Ser. No. 477,824, June 10, 1974. This application Apr. 14, 1975, Ser. No. 567,822
Claims priority, application Japan, Dec. 28, 1973, 49-3466
Int. Cl.² D05B *19/00, 21/00*
U.S. Cl. 112—121.15 **9 Claims**

7. An apparatus for automatically closing the toe of seamless hose comprising:

a plurality of parallel holding units, each said holding unit including a suction tube for receiving a toe portion of a hose and a pair of finger pieces mounted adjacent said suction tube;

means for moving said holding units in an endless path with said suction tubes disposed perpendicularly of said path;

means for spreading a welt portion of a hose having a toe portion in a suction tube of one of said holding units over said suction tube while pulling the toe portion out of said suction tube and over said finger pieces;



means for moving said finger pieces of a holding unit relative to the suction tube thereof to flatten a toe portion of a hose located thereover while carrying the toe portion away from said suction tube;

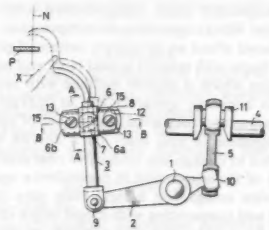
a sewing machine mounted outside said endless path and having a clamp for receiving and clamping a toe portion of a hose carried on the extended finger pieces of a holding unit and means for sewing the toe portion closed; and

a pneumatic system connected to the suction tubes of said holding units to selectively apply a suction force to each of said tubes to suck a hose having a closed toe portion into said suction tube.

3,952,674
METHOD AND APPARATUS FOR ADJUSTING THE LOOPER OPERATION LOCUS OF A SEWING MACHINE

Tetsuro Hirayama, Tokyo, Japan, assignor to Juki Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,707
Claims priority, application Japan, Nov. 16, 1973, 48-132573
Int. Cl.² D05B *1/06*
U.S. Cl. 112—199 **7 Claims**



1. An apparatus for adjusting the looper operation locus of a sewing machine, comprising:

a. a shaft,

b. a rotary carriage integrally formed with the shaft,

c. a looper guide,

d. means for slidably fixably mounting the looper guide on the rotary carriage,

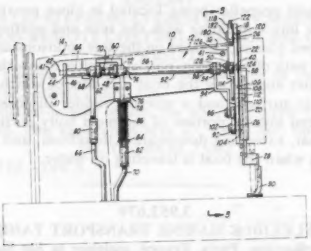
e. a looper guided and supported by the looper guide at an intermediate section thereof,
f. a reciprocally rotatable rocking arm having the looper connected thereto in the end part thereof,
g. a rotatable driving shaft,
h. a driving rod connected to the driving shaft at one end thereof and rocking forward and rearward, the driving rod being connected at its other end to the rocking arm to reciprocally rotate the arm, and
wherein the looper is held in the intermediate part and moves in its lengthwise direction while supported by the looper guide, the guide being movable and adjustable in a direction intersecting with the looper guiding direction with respect to the carriage.

3,952,675

SEWING MACHINE FEED CONVERSION APPARATUS

Elmer R. Thompson, 4712 Avenue Q, Lubbock, Tex. 79412

Filed Mar. 26, 1975, Ser. No. 562,209
Int. Cl.² D05B 27/04
U.S. Cl. 112—212 **4 Claims**



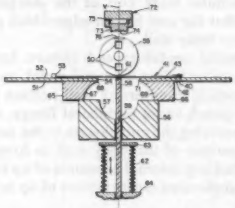
1. Apparatus for attachment to a sewing machine having a bottom workpiece feed mechanism comprised of a feed dog positioned in the work supporting surface of said machine which is raised and lowered by the oscillating motion of a lifting shaft and moved in the direction of feed and returned in the opposite direction by the oscillating motion of a feed shaft, a vertically oscillated needle bar, and a presser foot attached to a presser bar for urging the workpiece being stitched against said work supporting surface and said feed dog, said apparatus converting said sewing machine to one having a top and bottom workpiece gripping feed mechanism whereby workpieces of extra thickness can be fed through said mechanism and stitched by said machine, the apparatus comprising:
a frame adapted to be attached to a side of said sewing machine;
a vertically positioned tubular member pivotally attached to said frame so that said member is free to move horizontally but not vertically;
a feed foot bar telescopically mounted within the lower end of said tubular member so that said feed foot bar is free to move vertically and is moved horizontally with the movement of said tubular member;
a feed foot attached to said feed foot bar and positioned above said sewing machine work supporting surface adjacent said feed dog;
bell crank means for converting vertical oscillating motion to horizontal oscillating motion pivotally attached to said frame and to said tubular member so that horizontal oscillating motion is imparted to said tubular member;
feed rod means adapted to be operably connected to said feed shaft of said sewing machine so that vertical oscillating motion corresponding to the oscillating motion of said shaft is imparted to said feed rod means;
means for transmitting the vertical oscillating motion of said feed rod means to said bell crank means attached to said frame and connected between said feed rod means and said bell crank means so that when said feed dog is moved in the direction of feed and returned by the oscillating motion of said feed shaft, said tubular member is moved horizontally in a like manner;
link means attached to said feed foot bar for imparting vertical oscillating motion thereto;
lift rod means adapted to be operably connected to said lifting shaft of said sewing machine so that vertical oscillating motion corresponding with the oscillating motion of said shaft but in reverse directions is imparted to said lift rod means;
means for transmitting the vertical oscillating motion of said lift rod means to said link means attached to said frame and connected between said lift rod means and said link means so that when said feed dog is raised and lowered by the oscillating motion of said lifting shaft, said feed foot bar and feed foot attached thereto are simultaneously lowered and raised respectively.

3,952,676

DISPENSING CONTAINER MANUFACTURING APPARATUS AND METHODS

Winston G. Rockefeller, Woodcliffe Lake, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 308,999, Nov. 24, 1972, Pat. No. 3,832,964. This application Apr. 16, 1974, Ser. No. 461,299
Int. Cl.² B21D 51/36
U.S. Cl. 113—1 B **15 Claims**



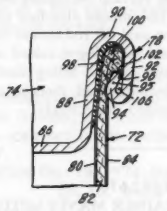
1. A method of making a collapsible tube body from a flat flexible sheet of composite metal-synthetic plastics material of predetermined dimensions that bears a finish coating on the side that is to be the outer surface of the tube body, which comprises the steps of positioning said sheet in a predetermined location across the mouth of an upwardly open forming die below a mandrel having a surface contour corresponding to the desired shape of the tube body with the longitudinal edges of the sheet substantially parallel to the mandrel axis, lowering the mandrel for clamping a longitudinally extending intermediate portion of said sheet against the mandrel surface with the side of said sheet that is to be the interior of said tube body contacting the mandrel surface and then displacing said mandrel and sheet downwardly into said forming die and wrapping said sheet substantially entirely around said mandrel with said longitudinal edges in predermined overlap, applying heat and pressure to said overlapped longitudinal edges while said mandrel holds the sheet in said die to form a longitudinally continuous body seam, and then removing the mandrel from said forming die and sliding the body off said mandrel.

3,952,677

CURLED CONTAINER BODIES, METHOD OF SECURING CLOSURES THERETO AND CONTAINERS FORMED THEREBY

William Herman Hartman, Rolling Meadows; Frank Bruno Pas, Carpentersville, and Joseph Lambert Godar, Wauconda, all of Ill., assignors to American Can Company, Greenwich, Conn.

Filed June 27, 1974, Ser. No. 483,761
Int. Cl.² B21D 51/26
U.S. Cl. 113—120 Y 4 Claims



1. A method of securing a metal container end closure to the marginal open end portion of an open-ended metallic cylindrical container body having an integral bottom and a metal body wall having a marginal open end portion whose thickness is less than about 0.0057 inch, to form a hermetically sealed container capable of holding internal pressures of up to about 90 psi developed at elevated temperatures of up to 140°F., which comprises:

providing an open-ended metallic cylindrical container body having an integral bottom and a metal body wall having a marginal open end portion whose thickness is less than about 0.0057 inch,

forming an annular body curl of the marginal open end portion so that the curl has an edge which points toward the container body wall,

providing a metal container end closure having merging panel portions including a central panel, an annular substantially vertical countersink wall portion peripheral to the central panel, and a peripheral flange, and

hermetically securing the end closure to the curled marginal open end poriton of the body wall to form a container capable of holding internal pressures of up to about 90 psi developed at elevated temperatures of up to about 140°F. by

providing a sealant material between the end closure countersink wall portion and the container body wall,

bending the closure flange into a skirt and closure hook having an edge,

mechanically engaging and exerting a compressive force by an end portion of the closure hook substantially axially against an end portion of the body curl, and

axially compressing the body curl with the end portion of the closure hook to hermetically pressure-resistantly secure the end closure to the container body.

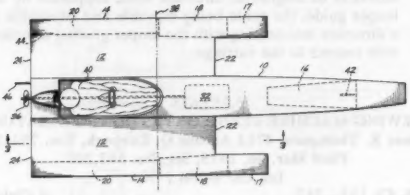
3,952,678

POWER BOAT

Paul H. Weston, 16422 NE. 29, Bellevue, Wash. 98008

Filed Jan. 27, 1975, Ser. No. 544,414
Int. Cl.² B63B 1/18
U.S. Cl. 114—66.5 S 3 Claims

1. A power boat comprising a central, longitudinally extending, main body portion extending substantially the full length of the boat, having a rear end portion engaging the water when the boat is traveling on water, and having a stepped planing surface on its underside, which stepped surface is disposed forward of the center of gravity of the power boat; two side sponsons disposed parallel to each other, parallel to, and connected with, said main body portion and extending from substantially the stepped surface on the main body portion to the rear end portion of the boat, each side sponson having a forward stepped planing surface on its underside and disposed forward of the center of gravity of the power boat, and each having a rear stepped planing surface on its underside and disposed rearward of the center of gravity of the power boat, thereby providing five stepped planing surfaces on which the power boat may be supported while traveling on water; a power plant, propeller drive shaft, and propeller disposed in the main body section of the power boat, providing for travel



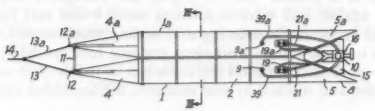
thereof, said propeller being located in close proximity to a transverse line coinciding with the rear end portions of the rear stepped planing surfaces on the side sponsons and having a circular path of operation, part of which is below the surface of the water supporting the boat and part of which is above such water surface; and a steering rudder disposed on the forward end bottom portion of the main body portion of the power boat, extending downwardly therefrom, and engaging the water when the boat is traveling on water.

3,952,679

FLEXIBLE MARINE TRANSPORT TANK

André Grihangne, Paris, France, assignor to Ste Superflexit, Courbevoie, France

Filed Nov. 29, 1973, Ser. No. 420,315
Claims priority, application France, Dec. 12, 1972, 72.44227
Int. Cl.² B63B 25/14
U.S. Cl. 114—74 T 12 Claims



1. A floating flexible marine transport tank assembly having means for loading and unloading liquid cargo comprising at least two flexible elements of revolution longitudinally and transversely connected by flexible harnesses prestressed by the pressurizing of said flexible elements, said flexible elements maintaining their geometry to internal pressurization thereof.

3,952,680

ROLL STABILIZER FOR VESSELS AT REST

Edward N. Griffin, 213 S. Pacific, No. C, Oceanside, Calif. 92054

Filed Sept. 30, 1974, Ser. No. 510,241
Int. Cl.² B63B 43/14
U.S. Cl. 114—123 13 Claims

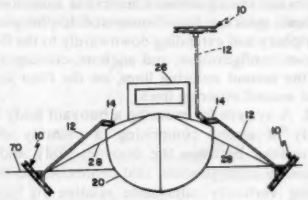
1. A roll stabilizer for reducing the swell induced rolling motion of a vessel in a body of water comprising:

a stabilizer disc means comprising a generally planer disc having a net buoyancy for floating said planer disc on a water surface and maintaining a major portion of said planar disc submerged,

pivot means secured to the vessel at a point spaced above the nominal water line of said vessel,

stabilizer arm means connected between said stabilizer disc and said pivot means for pivotal movement of said stabilizer disc about a generally horizontal axis in response to the passage of a swell,

one of said stabilizer disc means being secured on each of the two opposite sides of the vessel.



3,952,681

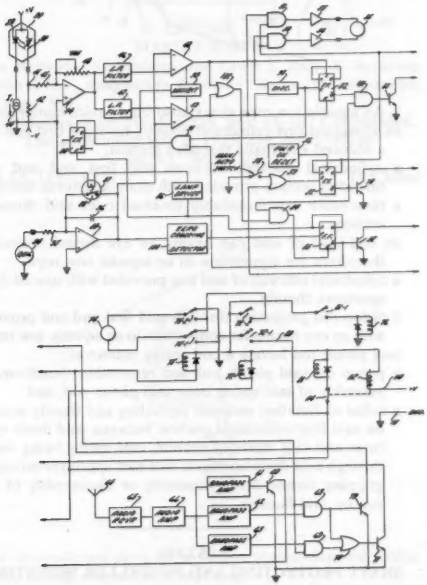
AUTOMATIC STEERING SYSTEM FOR VESSELS WITH A WIRELESS REMOTE CONTROL AND COURSE CHANGE CAPABILITY

Kenneth Tucker, Miami Lakes, Fla., assignor to Tucker Systems, Inc., Miami Lakes, Fla.

Continuation-in-part of Ser. No. 456,447, April 1, 1974, abandoned. This application May 27, 1975, Ser. No. 580,934

Int. Cl.² B63H *25/02*

U.S. Cl. 114—144 A **29 Claims**



25. An automatic pilot for a vessel having a steering mechanism comprising in combination, means for producing a deviation signal dependent upon the amount of deviation between an actual heading and a selected heading, a reversible steering motor coupled to the steering mechanism, measuring means for measuring the amount and direction of steering motor rotation, detector means responsive to the deviation signal and to the measuring means for energizing the steering motor for rotation in a corrective direction and for reversing the direction of rotation of the steering motor after an amount of corrective rotation proportional to the deviation signal, means for disabling the detector means during said reverse rotation, and means coupled to the measuring means and responsive solely to the measured amount of steering motor rotation for deenergizing the steering motor when said steering mechanism is returned to a neutral position.

29. A method of steering a vessel having a helm comprising the steps of selecting a desired heading, measuring the amount of deviation of an actual heading from the selected heading, moving the helm in a corrective direction a distance proportional to the amount of deviation, measuring the amount of corrective helm movement, and disregarding said deviation while returning the helm in dependence upon the measured amount of corrective helm movement to its initial position less a small predetermined angle.

3,952,682

STEERING ASSEMBLY FOR A MARINE CRAFT

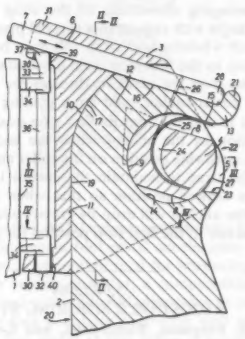
Michael J. Ingham, Epsom, England, assignor to Richard Marine Limited, Twickenham, England

Filed Dec. 2, 1974, Ser. No. 528,628

Claims priority, application United Kingdom, Dec. 4, 1973, 56244/73

Int. Cl.² B63H *25/06*

U.S. Cl. 114—162 **19 Claims**



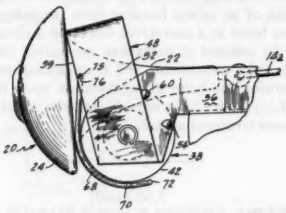
1. A marine craft steering assembly comprising a rudder stock having an aft edge and a forward edge adapted to be mounted on a craft for substantially horizontal steering movements, said stock having an internal space extending fore-and-aft with an opening through one of said edges of said stock and an inner wall which is spaced inwardly from the other edge of said stock, said inner wall being curved throughout at least a part of its extent with said curved part facing said opening and extending vertically with respect to and above said space; a pivot boss on said stock traversing said space horizontally; and a rudder blade having an internally curved surface pivotally mounting said blade on said boss, the walls of said internal space and said pivot boss defining a curved passage within said stock into which a part of said blade is insertable through said opening for mounting said blade pivotally on said boss.

3,952,683

ANCHOR DAVIT

Charles Nelson Eudy, P.O. Box 129, Houston, Miss. 38851, and Charles Ellis Eudy, 219 S. Park Drive, Jackson, Miss. 39211

Continuation-in-part of Ser. No. 430,098, Jan. 2, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,208
Int. Cl.² B63B 21/22
U.S. Cl. 114—210 10 Claims



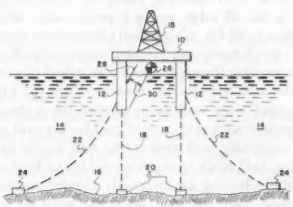
2. A davit for guiding the anchor line and supporting a boat anchor secured to said line which comprises a bracket having a rear end adapted to be secured to a boat and a front end adapted to extend outwardly beyond the side of the boat and including a pair of spaced sides, a shaft spanning the space between said spaced sides and mounted at its ends in said sides, a roller between said sides mounted on said shaft, a U-shaped strap having side legs overlapping said sides and a bight portion spaced outwardly from said roller, means swingably mounting said side legs of the strap on said sides of the bracket, a first stop limiting the downward swinging movement of the strap to hold the bight portion of the strap in front of the front end of the bracket, a second stop limiting the upward swinging movement of the strap to a downwardly disposed angle with respect to a vertical plane through the axis of the shaft whereby said strap will drop by gravity from the second stop to the first stop, said davit adapted to receive an anchor line over the bracket, through the strap, and around the roller to an anchor, said strap guiding said line over the roller and swingable from its first stop position to its second stop position by the anchor when the anchor line pulls the anchor to a stowing position on the roller and said second stop holding the strap to maintain the anchor in a gravitationally responsive stowed position so that when the anchor line is released the anchor will drop by gravity with the strap following the anchor to the first stop position for guiding the anchor line.

3,952,684

ADJUSTABLE MOORING SYSTEM

Hobart D. Ferguson, Richardson, and George W. Morgan, Dallas, both of Tex., assignors to Sun Oil Company (Delaware), Dallas, Tex.

Filed May 21, 1974, Ser. No. 472,032
Int. Cl.² B63B 21/50
U.S. Cl. 114—230 2 Claims



1. System for mooring a floating platform to the floor of a body of water, comprising: first anchors on the floor at a plurality of locations about the platform and laterally displaced therefrom; attachment devices vertically positionable relative to said platform and positioned about the periphery of the platform, said devices corresponding in number to the first anchors; first mooring lines connected between the first anchors and the attachment devices in a catenary configuration; second mooring lines connected to the platform about its periphery and extending downwardly to the floor in a parallelogram configuration; and anchors, corresponding in number to the second mooring lines, on the floor and connected to said second mooring lines.

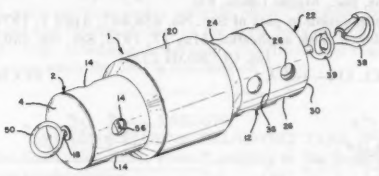
2. A system for mooring a buoyant body to the floor of a body of water, comprising: a plurality of mooring lines connected between the buoyant body and the floor in a catenary configuration, said connection to the buoyant body being vertically adjustable relative to said body; and a plurality of mooring lines connected between the buoyant body and the floor in a parallelogram configuration.

3,952,685

TOW ROPE DEVICE

Richard Lewis Hollenbush, 709 Benton St., Harrisburg, Pa. 17111

Filed July 30, 1975, Ser. No. 600,490
Int. Cl.² B63B 21/56
U.S. Cl. 114—235 R 4 Claims



1. An aquatic tow rope shock absorbing device comprising:
an elongated first cylindrical housing having a first end and a reduced externally threaded section,
a cylindrical sidewall between said first end and said threaded section provided with drain apertures therein,
a removable cap threadably received over said threaded section,
an end wall of said cap having an eye means projecting therefrom for connection to an aquatic tow rope,
a cylindrical sidewall of said cap provided with spaced drain apertures therein,
a piston rod projecting through said first end and provided with an eye means for connection to an aquatic tow rope,
said piston rod having a coil spring thereover,
a piston on said piston rod and removable therefrom for assembly of said spring over said piston rod, and
a collar of flotation material encircling and fixedly secured on said first cylindrical portion between said drain apertures and said threaded section, said spring being visible through said drain apertures and said apertures serving as gripping means during assembly or disassembly of said cap on said housing.

3,952,686

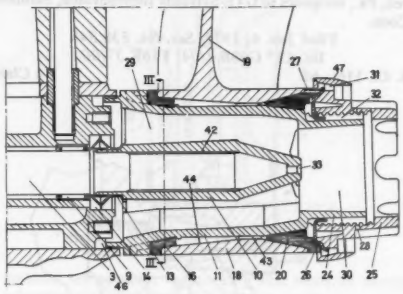
SHAFT PROTECTING AND PROPELLER MOUNTING SHEATH

Heinz Pichl, Bergtallsvagen 3, 75256 Uppsala, Sweden

Filed Dec. 11, 1974, Ser. No. 531,716
Int. Cl.² B63H 1/20
U.S. Cl. 115—17 12 Claims

1. In an outboard power leg for a boat comprising an underwater propeller shaft housing with a propeller shaft extending from a driven portion in said housing through an opening in said housing to a rearward portion for mounting a propeller

outwardly of said housing, said shaft being of a material subject to sea water corrosion, a sheath of corrosion resistant material fixed on and enclosing said rearward portion, hollow hub means of corrosion resistant material outwardly surrounding said sheath, spokes mounting said hub means on said sheath, said hub means and sheath defining an exhaust gas passage between said spokes, a propeller comprising a hollow



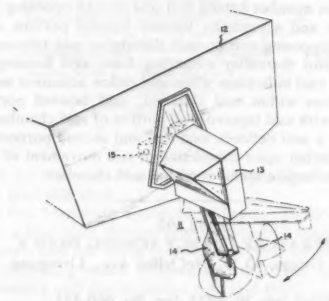
hub sleeve and blades extending outwardly therefrom, rubber or the like coupling means surrounding said hub means, said hub sleeve being engaged on and mounted by said coupling means, a hollow nut threadedly engaged on said hollow hub means rearwardly of said hub sleeve for retaining said sleeve on said coupling means, and means for directing engine exhaust gas rearwardly into said passage.

3,952,687

MARINE DRIVE

Alan Brownlie, Skaneateles, and Lewis J. Daly, E. Syracuse, both of N.Y., assignors to American Challenger Corporation, Fulton, N.Y.

Continuation of Ser. No. 416,228, Nov. 15, 1973, abandoned.
This application May 5, 1975, Ser. No. 574,620
Int. Cl.² B63H 5/12
U.S. Cl. 115—41 R **14 Claims**



13. An outboard drive for a marine engine disposed within a boat, having a transom, comprising:

a rigid housing adapted to extend through an aperture in the transom and having a forward end and having a stern end adapted to be coupled to the transom, said housing having an aperture in the forward end thereof said housing further including a portion which is normally disposed below the water line of the boat, said portion being watertight;

a drive shaft extending through said aperture and adapted to be connected to said engine;

an input shaft disposed generally parallel to the path of motion of said boat when said drive is in its normal position;

a vertical shaft connected to said input shaft and disposed substantially transverse to said path when said drive is in its normal position;

an upper unit disposed within said housing and mounted thereto by pivot means by which said upper unit may be rotated about a substantially horizontal axis disposed forward of said transom, said upper unit enclosing a transmission connected between said input shaft and said vertical shaft;

a flexible boot closing the stern end of said rigid housing and having an outer periphery coupled in watertight relationship about said housing and an inner periphery coupled in watertight relationship to said upper unit;

a propeller shaft connected to said vertical shaft;

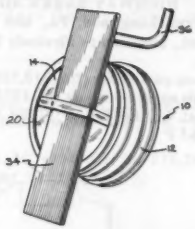
a pivot joint between said drive shaft and said input shaft, said pivot point being disposed in said drive at a pivot point which is inside said boat when said drive is mounted on said boat, said drive being rotatable out of its normal position about said pivot point.

3,952,688

ACCELERATOR MOVEMENT INDICATOR

Henry H. Merriman, 751 W. Washington Ave., Jackson, Mich. 49203

Filed May 16, 1974, Ser. No. 470,418
Int. Cl.² B60Q 5/00
U.S. Cl. 116—28 R **10 Claims**



1. An accelerator foot pedal movement indicator for vehicle internal combustion engine foot pedal accelerators comprising, in combination, a vibratable reed for producing a signal discernable by the vehicle operator, a compressible bellows operatively associated with said reed responsive to depression of the accelerator foot pedal for activating said reed upon depression of the foot pedal at and above a predetermined rate of movement, and third means for attaching said bellows to the foot pedal for operation thereby during foot pedal depression, said bellows being operative to actuate said reed upon the foot pedal being depressed at said predetermined rate of movement.

3,952,689

VEHICLE REGISTRATION AND VELOCITY DISPLAY DEVICE

Pierre-Rene Joubert, Dollard des Ormeaux, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

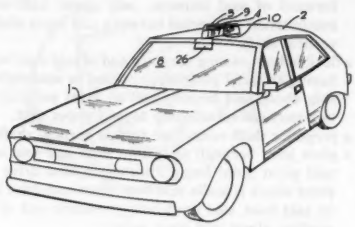
Filed Mar. 12, 1975, Ser. No. 557,676
Int. Cl.² B60Q 1/54
U.S. Cl. 116—57 **2 Claims**

1. A vehicle registration and velocity display device for a vehicle having a roof, a windshield and a registration number, said display device comprising

a housing mounted on a vehicle and having a top substantially parallel the roof of the vehicle and a plurality of

sides extending substantially perpendicularly between the top of the housing and the roof of the vehicle, said housing being positioned on the roof of the vehicle at the front thereof adjacent the windshield;

translucent visual indicating means on the top and each of the sides of the housing visually indicating the registration number of the vehicle;



lamp means in the housing for illuminating the indicating means, said lamp means producing a plurality of colors corresponding to the speed of the vehicle; and

a light conducting member extending from the housing over part of the windshield for indicating to an operator of the vehicle the color of the lamp means and therefore the speed of the vehicle.

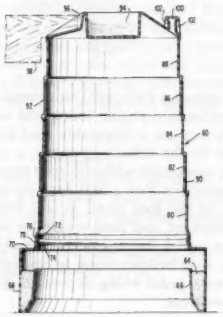
3,952,690
HIGHWAY BARRICADE

Rudolph R. Rizzo, Longwood, Pa., and Gabriel L. Julian, Hockessin, Del., assignors to Flexicade Ltd., Elsmere, Wilmington, Del.

Continuation-in-part of Ser. No. 218,758, Jan. 18, 1972, abandoned. This application Aug. 28, 1972, Ser. No. 284,186

Int. Cl.² E01F 9/01; G02B 5/122

U.S. Cl. 116—63 P **5 Claims**



1. A highway barricade comprising

a main body having upright sidewalls symmetrically arranged about a central vertical axis, said sidewalls having opposed portions horizontally spaced about 2 feet apart, said sidewalls converging upwardly toward said axis to permit nesting of a plurality of identical main bodies,

weighting means connected to a lower portion of the main body to stabilize the barricade and prevent its tipping when subjected to horizontally directed forces, said weighting means being a trough substantially coextensive with the sidewalls for receiving a weighting material, said trough being open upwardly to the interior of the barricade and having an inner wall inclined upwardly and inwardly, with the extent of inward extension of said inner wall being less than that which would contact the entire periphery of an identical barricade nested therewithin, and a stop means for supporting an identical unit nested thereon to prevent wedging together of the sidewalls.

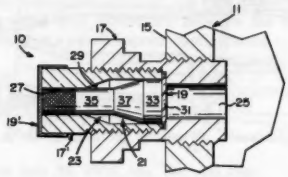
3,952,691
FLUID PRESSURE SENSOR DEVICE

John Robert Peltz, and Nikolaus A. Szeverenyi, both of Warren, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,546

Int. Cl.² G08B 1/04; F16K 37/00

U.S. Cl. 116—65 **4 Claims**



1. A sensor device for providing an indication when the fluid pressure within a container exceeds a pre-established level, said sensor device comprising:

a housing member adapted for being positioned within a wall of said container, said housing member defining a chamber having a first portion in communication with said fluid pressure within said container, a second portion in communication with the environment substantially about said container, and a tapered wall portion positioned between said first and second portions;

responsive means secured to said housing relative to said second portion of said chamber for being dislodged only when said fluid pressure within said container exceeds said pre-established level; a piston actuation member sealingly and retainedly located between oppositely disposed ends of the first and second portions of said chamber for moving within said chamber of said housing member and providing an indication only when said fluid pressure exceeds said preestablished level, said piston actuation member having first and second opposing end portions and a centrally located tapered portion, said second opposing end portion dislodging said responsive means and thereafter extending from said housing to provide said indication when said piston actuation member moves within said chamber, said tapered portion mating with said tapered wall portion of said chamber to provide a seal between said first and second portions of said chamber upon completion of said movement of said piston actuation member within said chamber.

3,952,692
TEMPERATURE CHANGE SENSING DEVICE

Edwards A. Griggs, 63 W. McClellan Ave., Livingston, N.J. 07039

Filed July 30, 1975, Ser. No. 600,411

Int. Cl.² G08B 7/02, 21/00

U.S. Cl. 116—102 **10 Claims**

1. A temperature sensing device which comprises:

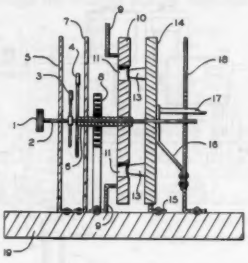
a. a first disc having at least one of a first cooperative coupling disposed about the surface thereof;

b. a second disc having at least one of a second cooperative coupling disposed about its surface;

c. a first shaft fixably attached to said first disc at its center and extending axially therefrom;

d. means fixably attached to said first shaft for translating changes in ambient temperature into rotational movement of said shaft;

e. a second shaft fixably attached to said second disc;
f. means for rotating said second shaft an amount equal to a desired temperature change, said first and second disc axially disposed and oriented relative to one another such that said first and second cooperative couplings align themselves when said means for translating changes in



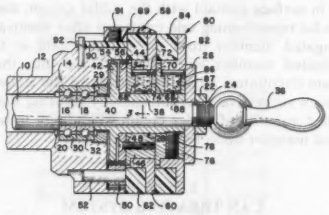
ambient temperature rotates said first shaft an amount proportional to the desired temperature change;
g. biasing means for urging said second disc axially towards said first disc when said first and second cooperative couplings are aligned; and
h. alarm trip means responsive to the movement of said second disc towards said first disc.

3,952,693

MACHINE TOOL DIAL ASSEMBLY

Hubert J. Parsons, Belleair Beach, Fla., and Charles D. Sherwood, Elmira, N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Aug. 20, 1974, Ser. No. 498,976
Int. Cl.² B23Q 17/00
U.S. Cl. 116—115.5 21 Claims



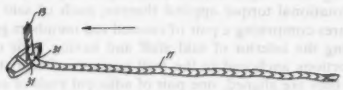
1. A machine tool dial assembly comprising:
a. a rotatable shaft,
b. a first frictionally adjustable indicator dial having indicia in a first scale thereon representative of linear displacement, said dial being positioned around a said shaft,
c. connecting means between said shaft and said dial for rotating said dial in unison with said shaft,
d. said connecting means including a first spring biased friction shoe urged into frictional contact with said dial,
e. a second frictionally adjustable indicator dial having indicia in a second scale thereon representative of linear displacement, said second dial being positioned around said shaft,
f. gearing means connected between said shaft and said second dial for rotating said second dial through more or less than one revolution as said first dial rotates through one revolution,
g. said gearing means including a second spring biased friction shoe urged into frictional contact with said second dial,
h. said gearing means including first and second externally toothed gears and third gear means in intermeshing engagement with said first and second gears.

3,952,694

MARINE SIGNALLING DEVICE

Ean Lawrence McDonald, 48 Ord St., West Perth, Australia

Continuation-in-part of Ser. No. 384,421, Aug. 1, 1973, abandoned. This application Nov. 15, 1974, Ser. No. 524,278
Claims priority, application Australia, Aug. 4, 1972, 58668/73
Int. Cl.² B63B 45/00
U.S. Cl. 116—124 B 13 Claims



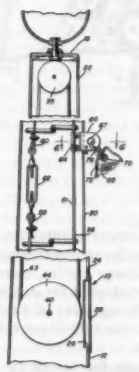
1. A signalling device for indicating the position of a boat in the water comprising a buoyant member adapted to be attached to the boat and being of a color contrasting with that of the sea, the buoyant member being of a length of sheeting which has a specific gravity of less than one and which is rolled or folded to occupy a small space for storage or transport and is adapted to unroll or unfold in the water, drag means, said sheeting including a free end and an end adapted to be attached to the boat, said drag means being operatively associated with said free end so that when in use will unroll or unfold and stream from the boat by remaining upwind from the boat, the length of said sheeting substantially greater than that of said boat.

3,952,695

SLOTTED TUBULAR FLAGPOLE

Otto A. Vollstedt, 5415 Palestine Ave., NW., Albany, Oreg. 97321

Filed Oct. 30, 1974, Ser. No. 519,285
Int. Cl.² G09F 17/00
U.S. Cl. 116—173 4 Claims



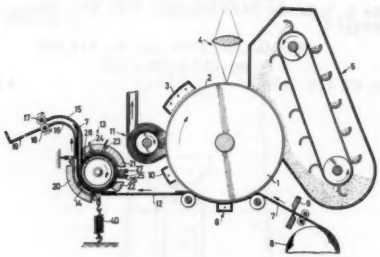
1. A flagpole construction including a tubular staff, said staff being provided with a longitudinal slot extending therealong throughout at least a major portion of the length of said staff, a plurality of bracing structures spaced along the slotted portion of said staff internally thereof and rigidly bracing the wall portions of said staff disposed on opposite sides of said

slot relative to remote peripheral portions thereof, generally aligned first and second pulley means journaled in opposite end portions of said staff for rotation about transverse axes, and an endless tension member trained about and frictionally engaged with said pulley means and including one reach thereof extending between said pulley means spaced closely inwardly of and extending along said slot, follower means attached to said one reach for movement therewith and including portions thereof spaced along said one reach and slidingly engaged in and projecting through said slot, and first and second anchor means carried by said follower means, disposed exteriorly of said staff and spaced along the latter for supportive engagement of the upper and lower inner corner portions of a flag therewith, at least one of said pulley means including drive input means adapting that pulley means to have rotational torque applied thereto, each of said bracing structures comprising a pair of crossed rod members generally bisecting the interior of said staff and having their opposite end portions anchored to the wall portions of said staff with which they are aligned, one pair of adjacent ends of each pair of crossed rod members being substantially equally spaced from and disposed on opposite sides of said slot, said one reach of said tension member being generally centered between said adjacent crossed rod member ends.

3,952,696
FIXING DEVICE FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

Wolfram Saupe, Mammolshain, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 24, 1974, Ser. No. 491,350
Int. Cl.² G03G *15/20*
U.S. Cl. 118—60 **15 Claims**



1. Contact fixing means adapted for use in an electrophotographic apparatus to fix an electrophotographically produced toner image on an image carrier, comprising

a. a web member adapted for continuous movement;

b. a continuous fixing layer of electrodonductive material comprising silicone rubber operable to define a heatable contact surface;

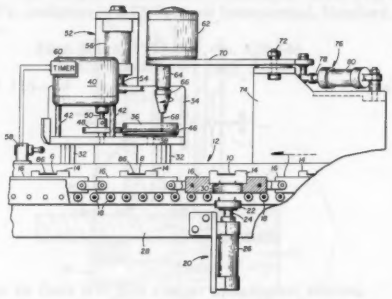
c. insulating means for mounting said electroconductive layer in electrically insulated relation on said web member; and

d. means for connecting said electroconductive fixing layer with a source of electrical energy, thereby to heat said fixing layer, said connecting means including a pair of contact means engaging the edges of said fixing layer, respectively, throughout substantially the entire length thereof.

3,952,697
SPOT-COATING APPARATUS

Gerry L. Bonkoske, Skokie, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 16, 1974, Ser. No. 515,389
Int. Cl.² B05C *1/02*
U.S. Cl. 118—263 **6 Claims**



1. An apparatus for dispensing a controlled quantity of solder cream on a workpiece at a predetermined location comprising:

a support for a said workpiece;

an elongated member having a rotational axis;

means coupled to said member for slowly rotating said member about said axis;

a container having a continuous surface defining an open cavity for retaining a stored amount of the solder cream;

means for selectively positioning one end of said elongated member from a first position in surface contact with the solder cream contained within said container to a second position removed from said container whereat the solder cream adhering to said elongated member is in contact with the workpiece thereby depositing a predetermined quantity of the solder cream upon the workpiece;

means for repositioning said one end of the elongated member in surface contact with the solder cream; and

means for repositioning said container after removal of said elongated member from the solder cream so that said elongated member when reintroduced into the solder cream encounters adjacent portions of the solder cream at each successive insertion thereby assuring that a controlled quantity of solder cream will adhere to said elongated member upon removal therefrom.

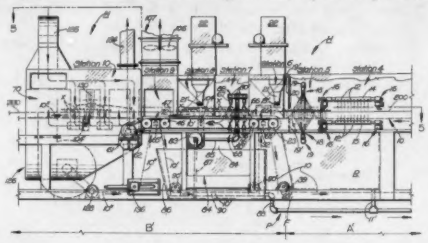
3,952,698
CAN TREATING SYSTEM

Arnold D. Beyer, Newark; Charles R. Crockett, and Patrick G. Mitchell, both of Oakland, all of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 401,401, Sept. 27, 1973. This application June 19, 1974, Ser. No. 480,807
Int. Cl.² B05C *7/02*
U.S. Cl. 118—314 **25 Claims**

1. A system for treating a closed end thin walled metal container body and the like comprising a plurality of treatment stations wherein a plurality of metal container bodies are simultaneously selectively advanced in substantially the same inverted position and with their closed ends up to and through the various treatment stations, means for applying water dilutable wash and rinse solutions to and for removing selected amounts of said wash and rinse solutions from the surfaces of the container bodies as the bodies pass through certain stations of the system, means for directing a free flowing coating material at relatively high volumes and in the form of full cone overlapping flood-like sprays simultaneously against substantially all inside and outside surface portions of at least one metal container body as it is advanced through another station

of said system, said coating material directing means being arranged to direct said overlapping sprays simultaneously against substantially all of the said surface portions of the container body in such fashion as to effect a hydro-fluidic balancing and stabilization of the container body in a predetermined coating material receiving position by selective fluid pressure contact of the closed end of the container body as the body passes through the coating station, separate open mesh



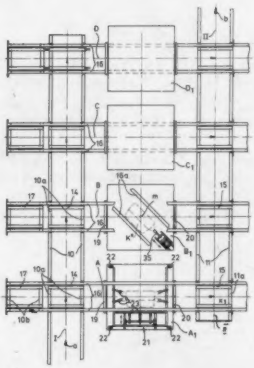
conveyors for supporting and moving a container body in substantially the same inverted position and with its closed end up through the stations for applying the wash and rinse solutions and the coating material applying station, and means interposed between said conveyors for transferring the container body from one open mesh conveyor to the other without effecting any material change in the said inverted position of the container body.

3,952,699

METHOD AND APPARATUS FOR TREATING A WORKPIECE AT A TREATING STATION

Heinz Dürr, Stuttgart-Feuerbach, and Klaus Gäfgen, Hemmingen, both of Germany, assignor to Otto Durr Stuttgart-Zuffenhausen, Germany

Filed Mar. 19, 1974, Ser. No. 452,552
Int. Cl.² B05C *11/12*, *5/00*; B05B *13/04*
U.S. Cl. 118—315 **12 Claims**



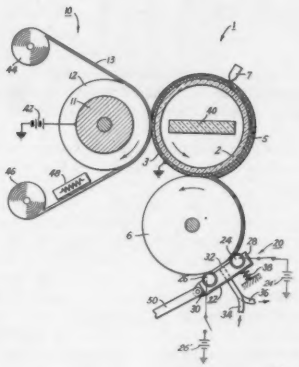
1. An apparatus for treating a workpiece at treating stations, particularly for applying a surface coating to a vehicle body or the like, comprising a first elongated conveyor defining a first path for travel of a suspended workpiece; a second elongated conveyor defining a second path transversely spaced from said first path for travel of a suspended treated workpiece; a plurality of treating stations intermediate said paths and spaced from one another longitudinally of said paths; and a plurality of guide tracks, each extending from said first to said second conveyor at a respective one of said treating stations, at least some of said guide tracks are provided at the respectively associated treating station with a track station which is turnable about a vertical axis, so that a workpiece suspended from said track section is turnable about said axis with reference to the respective treating station.

3,952,700

LIQUID APPLICATOR

William S. Little, Jr., Rochester, and Robert H. Townsend, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 87,720, Nov. 9, 1970, Pat. No. 3,703,459.
This application Aug. 30, 1972, Ser. No. 284,803
Int. Cl.² G03G *15/10*
U.S. Cl. 118—637 **6 Claims**



1. An apparatus adapted to supply a liquid to a surface comprising:

i. a backing member having leading and trailing endwalls and opposed sidewalls;

ii. endwall sealing means affixed to said backing member for effecting a seal with the surface to which a liquid is to be applied comprising one sealing member situated proximate the leading endwall, and another member situated proximate the trailing endwall; said latter sealing member being adapted to effect a seal with the surface to which a liquid is to be applied wherein at least the endwall sealing member affixed to the backing member proximate the leading endwall thereon is a roller;

iii. sidewall sealing means for effecting a seal with the surface to which a liquid is to be applied affixed to the sidewalls of said backing member and extending to said endwall sealing member;

said backing member, the trailing endwall sealing member and said sidewall sealing means cooperating with the surface to which a liquid is to be applied to define a chamber therebetween adapted to contain a liquid;

iv. means for supplying liquid for said chamber;

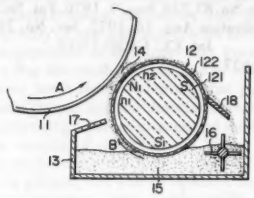
v. means for regulating the contact pressure of said apparatus with the surface to which a liquid film is to be applied, whereby upon relative motion between said apparatus and said surface, a uniform film of liquid is applied to said surface only between the leading endwall sealing member and the surface; and

vi. a power source connected to at least one endwall sealing member to electrically bias said sealing member.

3,952,701
ELECTROSTATIC DEVELOPING APPARATUS

Keitarou Yamashita, Kamisato, and Takafumi Aoyama, Kumagaya, both of Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Nov. 5, 1974, Ser. No. 521,091
Int. Cl.² G03G 15/08
U.S. Cl. 118—637 10 Claims



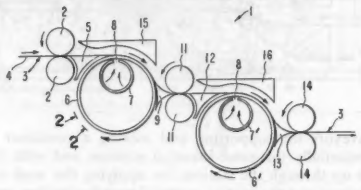
1. An electrostatic developing apparatus comprising:
an electrostatic copy paper having an electrostatic latent image formed thereon according to an electrophotographic process;
a hollow, non-magnetic cylinder which is rotatable and disposed in the close vicinity of said electrostatic copy paper;
a permanent magnet stationary within said hollow, non-magnetic cylinder, said permanent magnet having a plurality of elongated magnetic poles of the same polarity extending in the axial direction of said non-magnetic cylinder, in a portion adjacent to said electrostatic copy paper, said elongated magnetic poles being closely located whereby the lines of the magnetic forces produced from said elongated magnetic poles repel against each other and said elongated magnetic poles serve as developing magnetic poles;
means for supplying developer to a periphery of said hollow, non-magnetic cylinder;
means for moving said electrostatic copy paper in relation to said hollow non-magnetic cylinder; and
means for rotating said hollow non-magnetic cylinder about its center around the outer periphery of said fixed permanent magnet;
whereby a magnetic brush having a large width in the circumferential direction is formed with developer on such a portion of said hollow, non-magnetic cylinder which faces said electrostatic copy paper, by means of the developing magnetic poles on said non-magnetic cylinder, and then the surface of said electrostatic copy paper is rubbed with said magnetic brush, as said electrostatic copy paper moves, thereby developing said electrostatic latent image to a visible image.

3,952,702
ELECTROPHOTOGRAPHIC LIQUID TONER DEVELOPMENT APPARATUS

Raymond L. Levy, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation of Ser. No. 127,683, March 24, 1971, abandoned. This application Dec. 9, 1974, Ser. No. 530,783
Int. Cl.² G03G 15/10
U.S. Cl. 118—637 6 Claims

1. Apparatus for developing a charge image on the surface of a flexible recording medium through the use of a dielectric development fluid comprising, in cooperative combination:
a. a perforated development electrode having an upwardly-facing surface,
b. means for positioning a charge image bearing surface of a recording medium above and facing downwardly so as to be in physical contact with said upwardly-facing surface of said development electrode such that the portion of said recording medium in physical contact with said development electrode conforms directly to the configuration of the portion of said development electrode with which it is in contact, said means for positioning being free of the surface of said recording medium opposite said charge image bearing surface thereof over the portion of said recording medium adjacent said development electrode so that in absence of said recording medium, said means will not become wet by flow of said dielectric development fluid whereby said opposite surface of said recording medium will always remain dry, even if continuity thereof is interrupted,
c. means for continuously causing said dielectric development fluid to flow upwardly through the perforations in

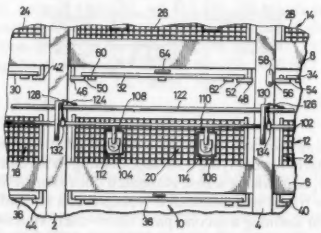


said development electrode and against said charge image bearing surface of said recording medium, when present, so as to tend to form a fluid boundary layer on said recording medium, said development electrode, said recording medium, and said means for positioning all positioned to be free of said fluid in absence of said dielectric development fluid flow, and
d. means for causing relative motion between said development electrode and said recording medium so as to cause the surface of said development electrode to remove continuously and substantially and replenish said boundary layer of said dielectric development fluid from between said development electrode and said recording medium.

3,952,703
BATTERY-LIKE ARRANGEMENT OF CAGES FOR REARING AND TRANSPORTING POULTRY

Arthur Erfeling, Cuxhaven-Altenwalde, Germany, assignor to Lohmann Apparatebau GmbH, Altenwalder Chausse, Germany

Filed Feb. 3, 1975, Ser. No. 546,752
Claims priority, application Germany, Aug. 16, 1974, 2439368
Int. Cl.² A01K 31/00
U.S. Cl. 119—17 11 Claims



1. A battery of cages for rearing and transporting poultry comprising, in combination, a battery frame including a plurality of vertical support columns, a plurality of vertically spaced horizontal carriers mounted upon said columns defining a plurality of stories, a plurality of separate cage units supported upon said carriers at predetermined positions, said

cage units each having an open top and a marginal height less than the vertical spacing of said carriers and substantially corresponding to the transporting height of said cage units, a plurality of separate covers to selectively close said cage units open tops, and cover holding fittings defined on said battery frame adjacent each of said predetermined positions holding a cover vertically spaced above a cage unit open top whereby a cover may be readily placed upon a cage unit open top to close said cage units for transport.

3,952,704

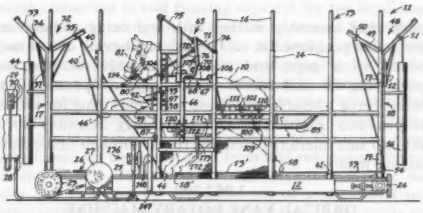
HEAD-SET APPARATUS FOR TRAINING HORSES

Joe A. Webb, E. Lincoln St., Searcy, Ark. 72143

Division of Ser. No. 364,632, May 29, 1973, Pat. No. 3,824,961. This application July 18, 1974, Ser. No. 489,528

Int. Cl.² A01K *15/00*

U.S. Cl. 119—29 **14 Claims**



1. An apparatus for training a horse comprising:

a. an elongated enclosure frame for receiving a horse, said frame comprising opposed side frame members and front and rear ends,

b. a head-set device comprising an arm member and at least one linear member, each linear member having first and second end portions,

c. means mounting said arm member on said side frame member to project from said side frame member transversely over a horse within said enclosure frame and behind the horse's head, in operative position, said mounting means mounting said arm member for fore-and-aft movement with the horse's head relative to said enclosure frame,

d. first connector means detachably connecting each of said first end portions to the head harness worn by a horse within said enclosure frame, and

d. second connector means detachably connecting each of said second end portions to said arm member for holding the horse's head in a predetermined attitude.

3,952,705

ANIMAL OPERATED DEVICE FOR COORDINATED FEEDING OF LIQUID AND GRAIN SUPPLEMENT TO LIVESTOCK

Bill B. Witmer, Sioux Falls; Mylo A. Hellickson, Brooking, and David B. Goos, Esteline, all of S. Dak., assignors to Farmers Union Grain Terminal Association, St. Paul, Minn.

Filed Apr. 9, 1975, Ser. No. 566,229

Int. Cl.² A01K *5/00*

U.S. Cl. 119—51 R **12 Claims**

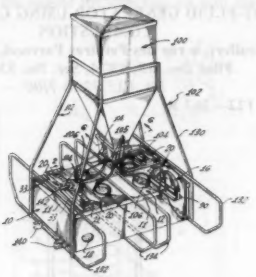
1. In a liquid and solid grain feeder having a liquid feed container, a closure for said liquid feed container and at least one lick wheel rotatably mounted therein with a portion of the circumference of said lick wheel extending through an opening in said closure, the improvement which comprises;

means for providing an adjustable opening over the said portion of said lick wheel extending through said opening of said closure;

means for adjusting said lick wheel, along a substantially vertical axis, to a predetermined spacing with respect to said means for providing said adjustable opening;

a drive means fixedly mounted to said vertically adjustable lick wheel and including a drive shaft rotatable in proportion to the rotation of said drive means;

a solid feed bin;



feed conveyor means, communicating with said solid feed bin, and operatively connected to said drive shaft to rotate in proportion to the rotation of said drive shaft;

means to vary the amount of solid feed fed to said conveyor means independently of the rate of rotation of said drive shaft;

a feed trough; and

feed outlet means leading from said conveyor means to said feed trough.

3,952,706

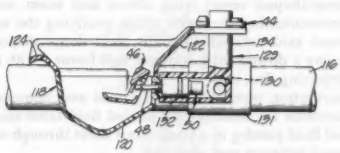
POULTRY WATERING DEVICE

Harold W. Hart, Glendale, Calif., assignor to H. W. Hart Mfg. Co., Glendale, Calif.

Division of Ser. No. 342,387, March 19, 1973, Pat. No. 3,870,022. This application Dec. 16, 1974, Ser. No. 532,764

Int. Cl.² A01K *39/02*

U.S. Cl. 119—75 **3 Claims**



1. A poultry drinking cup comprising:

a cup body having a vertical axis and a water input opening;

means to connect said cup body to a water feeder line for receipt of water by said cup body through said input opening;

valve means to control the flow of water through said input opening into said cup body;

means actuatable by poultry using the drinking cup to control said valve means and to admit water into said cup body on the demand of the poultry;

an outwardly-flared, upwardly-directed skirt on said cup body positioned to increase the drinking area of the cup and to reduce the incidence of water spillage from the cup body during usage;

said skirt having a straight upper edge surface positioned in a plane transverse to the vertical axis of said cup body;

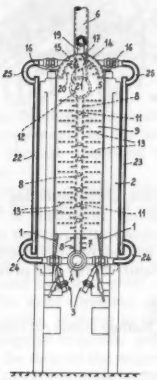
a spout formed at the upper edge surface of said skirt;
said spout extending outwardly from said skirt in a generally transverse direction with respect to the vertical axis of said cup body, and
said spout extending outwardly from said skirt for a sufficient distance to divert overflowing water away from said cup body.

3,952,707

HOT-FLUID GENERATOR USING CATALYTIC COMBUSTION

André Brulfert, 6 rue des Peintres Parrocel, Avignon, France

Filed Dec. 18, 1974, Ser. No. 533,811
Int. Cl.² F22B *7/00*
U.S. Cl. 122—367 R **13 Claims**



1. A hot-fluid generator comprising:
at least two vertical catalyst elements having spacedly juxtaposed broad surfaces for the combustion of a hydrocarbon fuel to generate heat;
a thin hollow vertical panel forming a main vessel and composed of continuous heat-conductive walls interposed between and substantially coextensive with said surfaces;
a supply pipe below said vessel and communicating therewith for supplying a fluid to said vessel at the bottom thereof; and
a dome-shaped vessel lying above said main vessel and communicating therewith while overlying the space between said catalyst elements, said dome-shaped vessel having a downwardly concave wall formed with inwardly projecting fins, and
a distribution pipe above said vessel and communicating therewith for withdrawing heated fluid from said vessel, said fluid passing in a continuous sheet through said main vessel between said elements.

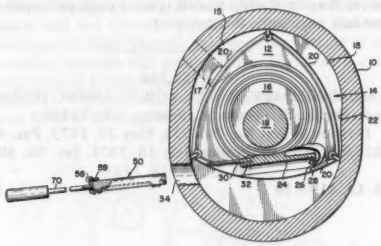
3,952,708

ROTOR MOUNTED SPARK PLUG FOR ROTARY ENGINE

Harvey A. Burley, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1973, Ser. No. 406,800
Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.
Int. Cl. F02b *53/12*
U.S. Cl. 123—8.09 **5 Claims**

1. In a rotor mounted spark plug for a rotary combustion engine, the engine comprising a housing having a cavity, a rotor disposed in said cavity, said rotor having a plurality of adjoining peripheral faces, an output shaft rotatably supported by said housing and having an eccentric rotatably supporting said rotor, said rotor peripheral faces and said housing cooperatively providing a plurality of variable volume working chambers spaced around said rotor that move with said rotor within said housing, intake passage means periodically connected to said working chambers as said rotor moves, exhaust passage means periodically connected to each of said working chambers as said rotor moves; the improvement comprising: said rotor peripheral faces each having an elongated spark plug receiving recess extending laterally thereacross, an elongated



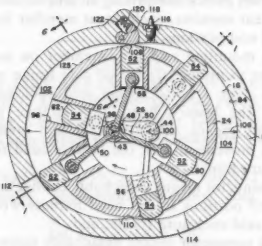
spark plug assembly mating with and being slidably and removably positioned in said recess and having one or more spaced spark gaps, and means releasably retaining said spark plug in said recess during engine operation, said means being operable to release said spark plug for slidaale removal and insertion of said spark plug assembly out of and into said laterally extending recess through said exhaust passage means.

3,952,709

ORBITAL VANE ROTARY MACHINE

John W. Riddel, Fenton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 23, 1974, Ser. No. 517,211
Int. Cl.² F02B *53/04*
U.S. Cl. 123—8.31 **3 Claims**



1. A rotary internal combustion engine comprising a housing having a cavity, a first half of said cavity being in the form of a segment of a cylinder having a first center axis and a predetermined radius, a second half of said cavity being in the form of a segment of a cylinder having a second center axis and a radius equal to that of said first half of said cavity, said center axes being spaced a predetermined distance providing a cavity major axis and a cavity minor axis at top dead center and bottom dead center positions of said housing cavity, a rotor having a diameter substantially equal to said minor axis centrally positioned in said cavity, an output shaft rotatably supported in said housing, said output shaft being secured to said rotor for rotation therewith, a first trunnion secured to said housing at the first center axis within said cavity, a first vane set including three equiangularly spaced vanes extending across the axial length of said cavity parallel to said output shaft, each vane being slidably mounted in said rotor for extension and retraction relative thereto, a plurality of connecting links pivotally connecting each of the vanes in said first vane set with said first trunnion for rotation thereabout, a second trunnion secured to said housing at the second center

axis within said cavity, a second vane set including three equiangularly spaced vanes slidably mounted in said rotor and being specifically spaced relative to the vanes of said first vane set while also extending the axial length of said cavity parallel to said output shaft, a plurality of connecting links pivotally connecting the vanes of said second vane set to said second trunnion for rotation thereabout, the pivotal connection of each link to a respective vane permitting pivotal movement of the link relative to its respective vane such that in a full extended position the length of the link and its respective vane substantially equals the radius of said first and second one-halves of said cavity thereby assuring engagement of said vane with said cavity wall in such position, the vanes terminating in a curved end surface insuring engagement of the vane with said housing during rotation through the cavity while being in its extended position permitting operation of the internal combustion engine without incorporating seal assembles in the vane end surfaces, an intake port position in said housing directing an air-fuel mixture into said first one-half of said cavity, an exhaust port positioned in said housing in fluid connection with said second one-half of said cavity, ignition means connected to said housing adjacent the top dead cener position of said cavity for igniting a compressed fuel mixture therein, the vanes of said first vane set being extended from said rotor engaging said housing compressing the air-fuel mixture entering through said intake port during rotation through said first one-half of said cavity and retracting into said rotor out of engagement with said housing during rotation through said second one-half of said cavity, the vanes of said second vane set being extended from said rotor engaging said housing during combustion of said mixture powering said rotor and sweeping burned gases out of said exhaust port during rotation through said second one-half of said cavity and retracting into said rotor out of engagement with said housing during rotation through said first one-half of said cavity, and a transfer valve being positioned at the top dead center position of said housing, said valve being spring biased into engagement with said rotor preventing back flow of the compressed air-fuel mixture contained between a vane of said second vane set in engagement with said housing at a predetermined distance past dead center position permitting combustion of the compressed mixture by said ignition means and subsequent power output to said shaft.

3,952,710

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINES

Junji Kawarada, Kariya; Kunio Endo, Anjo; Susumu Harada, Oobu, and Motoharu Sueishi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 15, 1973, Ser. No. 416,277

Claims priority, application Japan, Nov. 17, 1972, 47-115934

Int. Cl.² F02D *5/02*

U.S. Cl. 123—32 EA **4 Claims**

1. An air-fuel ratio control system for an internal combustion engine comprising:

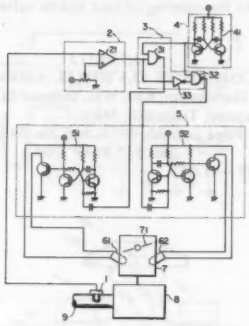
an oxygen concentration detector mounted in an exhaust manifold of an internal combustion engine for detecting the concentration of oxygen contained in the exhaust gases from the engine to produce a detected signal,

an air-fuel ratio discriminating circuit connected to said oxygen concentration detector for comparing the detected signal with a predetermined value to produce a discrimination signal having a first value when said discrimination signal is greater than said predetermined value and a second value when said discrimination signal is less than said predetermined value of said detected signal,

a sampling signal generating circuit for generating a sequence of sampling signals at a predetermined frequency,

an injection command circuit connected to said air-fuel ratio discriminating circuit and said sampling signal generating circuit for generating a first command signal for causing injection of air into the engine in response to one of said first and second values of said discrimination signal and a second command signal for causing injection of fuel in response to the other one of said first and second values every time said sampling signal is delivered to said injection command circuit,

an air-injection electromagnetic valve mounted in an intake manifold of the engine for injecting air into the engine,



a fuel-injection electromagnetic valve mounted in said intake manifold of the engine for injecting fuel into the engine, and

injection control means connected to said injection command circuit for opening said air-injection valve in response to said first command signal and said fuel-injection valve in response to said second command signal.

3,952,711

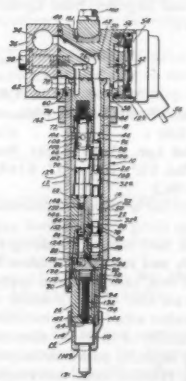
DIESEL INJECTION NOZZLE WITH INDEPENDENT OPENING AND CLOSING CONTROL

John A. Kimberley, East Granby, Conn., and Richard D. Kraus, Chicopee, Mass., assignors to Ambac Industries, Inc., Springfield, Mass.

Filed Mar. 4, 1975, Ser. No. 555,243

Int. Cl.² B05B *1/30;* **F02M** *47/00*

U.S. Cl. 123—32 JV **9 Claims**



3. In a fuel injection apparatus comprising a nozzle assembly having a nozzle valve, spring means for biasing said nozzle valve toward a normally closed position, conduit means for directing a metered flow of high pressure fuel into said nozzle to open said nozzle valve, and means for delivering metered

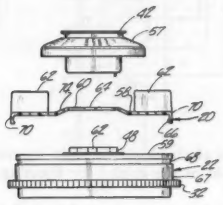
fuel under a high pressure into said conduit means in timed relation with an engine operating cycle, the improvement comprising means augmenting said spring means for hydraulically closing said nozzle valve, said latter means comprising a chamber, said valve extending into said chamber and presenting a radial surface therewithin, means for delivering a fluid at injection pressure into said chamber to effect a closing force on said nozzle valve in conjunction with said spring means immediately upon conclusion of said metered fuel delivery, and means for returning said chamber to a low ambient pressure prior to the opening of said nozzle valve.

3,952,712

COMPOSITE FLYWHEEL ASSEMBLY

William O. Hermanson, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Jan. 30, 1975, Ser. No. 545,484
Int. Cl.² F01P 7/04
U.S. Cl. 123—41.65 **7 Claims**



1. A composite flywheel assembly for an air-cooled internal combustion engine comprising a metallic flywheel having a flat axially facing surface and a peripheral surface with a continuous radially facing groove, an impeller integrally molded of resilient material having a base which rests upon said axially facing flywheel surface, a circumferential array of axially extending blower vanes and an axially extending flange depending from said impeller base about said peripheral surface with a radially inwardly protruding tongue at the free edge of said flange, said tongue having a free-state diameter which is less than the diameter of said groove and being received in snap-fit engagement in said groove, and means centrally urging said impeller base against said axially facing flywheel surface.

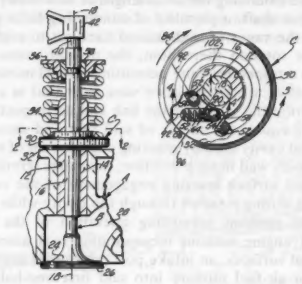
3,952,713

VALVE ROTATOR

Max J. Tauschek, South Euclid, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 23, 1975, Ser. No. 570,625
Int. Cl.² F01L 1/32; F16K 29/00
U.S. Cl. 123—90.3 **14 Claims**

10. A rotator for a valve reciprocable between open and closed positions along a longitudinal axis and being rotatable about said axis, said rotator including first and second parts movable axially and rotatably relative to one another along and about said axis, variable force applying means for urging said valve toward said closed position and urging said parts toward one another with forces which alternately increase and decrease, a plurality of shiftable elements between said parts movable along separate paths for imparting relative rotation thereto during relative axial movement therebetween, said parts being mounted for imparting rotational movement to said valve during relative rotational movement between said parts, said paths having midpoints, a reference circle intersecting said midpoints and having a center coincidental with said longitudinal axis, said paths being positioned to have path components extending generally along said circle and path components extending both inwardly and outwardly of said circle from said midpoints, and all of said paths together



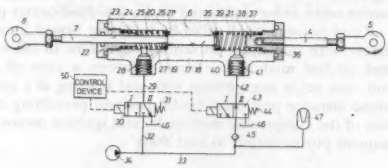
having a total path length which is greater than the circumference of said circle.

3,952,714

LINK LENGTH ADJUSTING APPARATUS

Herbert Weyer, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 266,752, June 27, 1972, abandoned.
This application Mar. 14, 1974, Ser. No. 451,374
Claims priority, application Germany, July 5, 1971, 2133244
Int. Cl.² F02D 31/00, 11/02
U.S. Cl. 123—103 C **7 Claims**



1. In an internal combustion engine, a combination comprising a fuel-dosing arrangement comprised of a movable fuel-dosing control member movable through a plurality of positions to vary the amount of fuel entering the cylinders of the engine per combustion cycle; a footcontrolled gas pedal member; elongated linkage means connected between said gas pedal member and said control member for transmitting force from said gas pedal member to said control member in direction substantially longitudinally of said elongated linkage means in order to position said fuel-dosing control member in dependence upon the extent to which said foot-controlled gas pedal member is depressed by the foot of a driver, said linkage means comprising a double-acting hydraulic cylinder-and-piston unit comprised of a cylinder and of a piston in said cylinder dividing the interior of said cylinder into two cylinder chambers, said cylinder and piston being slidable relative to each other substantially in the direction of elongation of said elongated linkage means, with one of said members being connected to said cylinder and the other of said members being connected to said piston, and wherein said cylinder has a first fluid port communicating with the first of the cylinder chambers and a second fluid port communicating with the second of the cylinder chambers; and length-varying means for effecting movements of said fuel-dosing control member independently of movement of said gas pedal member by effecting changes in the length of said linkage means, and comprising a source of pressurized fluid, a tank, and valve means connecting said first and second fluid ports of said cylinder to said source of pressurized fluid and to said tank

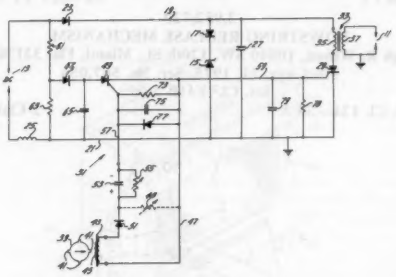
and operative for changing the length of said elongated linkage means by causing hydraulic fluid to flow into and out of said cylinder chambers to effect relative movement between said cylinder and said piston.

3,952,715

VARIABLE AND CONSTANT TIMING FOR BREAKERLESS IGNITION

Howard E. Van Siclen, Jr., Sidney, N.Y., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 6, 1974, Ser. No. 467,325
Int. Cl.² F02P 1/00, 5/04
U.S. Cl. 123—117 R 9 Claims



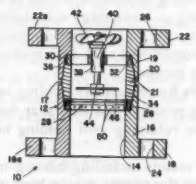
1. A triggering circuit comprising a solid state electronic switching device, pulse generating means for generating a succession of electrical trigger pulses which change amplitude in response to a condition to switch the switching device, voltage bias means connected between the pulse generating means and the switching device to change the switching time relative to the trigger pulses in response to the condition, and means for controlling the voltage on the bias means independently of pulse amplitude to control the switching time relative to the trigger pulses, the means for controlling the voltage on the bias means being connected in parallel with the bias means and including a resistor connected in parallel with a series connected second resistor and Zener diode.

3,952,716

FUEL CONSERVATION MEANS FOR INTERNAL COMBUSTION ENGINES AND THE LIKE

Roger A. McCauley, Tulsa, Okla., assignor to Rexar Industries, Inc., Tulsa, Okla.

Filed June 24, 1974, Ser. No. 482,269
Int. Cl.² F02M 29/00
U.S. Cl. 123—141 12 Claims



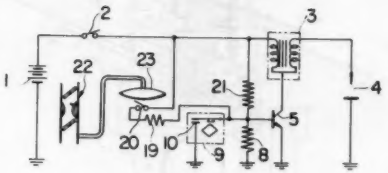
1. A fuel conservation device adapted to be interposed in a flow stream for receiving a fuel-air mixture therethrough and comprising rotor means initially intercepting the fuel-air mixture and being rotated thereby, sonic reed means disposed downstream of the rotor means for impressing sonic vibrations on said fuel-air mixture to facilitate mixing of the fuel and air components thereof, and heated grid means disposed downstream of the sonic reed means for substantial vaporization of the fuel-air mixture.

3,952,717

IGNITION SYSTEM WITH ADJUSTABLE CONTACT BREAKER CURRENT

Kenji Goto, and Daisaku Sawada, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Oct. 24, 1973, Ser. No. 409,084
Claims priority, application Japan, Feb. 6, 1973, 48-14247
Int. Cl.² F02N 17/00
U.S. Cl. 123—179 BG 8 Claims



1. An engine ignition system for supplying at least two different current magnitudes to the breaker points of a circuit interrupter of said ignition system, the second current magnitude being greater than the first current magnitude and sufficient to remove contaminants from said breaker points to prevent fouling or damage thereof, said ignition system comprising:

an ignition coil having primary and secondary windings; a D.C. source coupled to said primary winding; a spark plug coupled to the secondary winding of said ignition coil;

a semiconductor amplifier operated in its saturated mode and having a first grounded terminal, a second output terminal connected in common to said primary and secondary ignition coil windings and a third control terminal coupled to ground through first bias impedance means and to said D.C. source through second bias impedance means;

circuit interrupter means having a first breaker contact connected to ground and a second breaker contact connected to the junction of said first and second impedance means and said third control electrode, for intermittently making and breaking contacts between ground and said junction; and

means for changing the resistance value of said second imedpance means from said first to said second magnitude as a function of a preset operating condition of said engine to increase the current magnitude supplied to said breaker contacts.

3,952,718

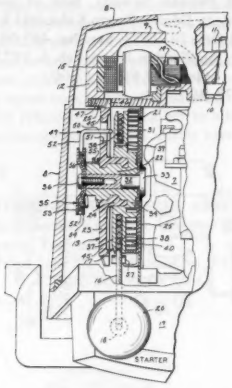
STARTER APPARATUS FOR INTERNAL COMBUSTION ENGINES

James A. Meyer, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Aug. 12, 1974, Ser. No. 496,882
Int. Cl.² F02N 17/00
U.S. Cl. 123—179 SE 21 Claims

1. In combination with an internal combustion engine having a starter member secured to the engine crankshaft and having an outer wall located laterally outwardly of the engine, a starter assembly having mounting means for securement to the side of the engine beneath said starter member and comprising, a drive member rotatably mounted immediately adjacent to the engine and having a rotating axis generally normal to the axis of the starter member and movable outwardly from the engine into driving engagement with the starter member,

and means to rotate the drive member to move the drive member outwardly into and inwardly from engagement with



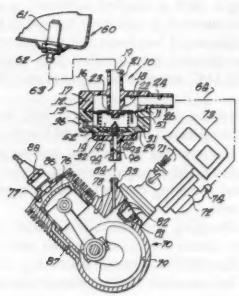
said starter member to rotate the starter member and crankshaft for starting of the engine.

3,952,719

VACUUM PULSE ACTUATED FUEL CONTROL VALVE

Robert A. Fenton, St. Louis, Mo., and Daniel L. Donovan, Decatur, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 28, 1975, Ser. No. 563,032
Int. Cl.[2] F02B 77/00; F02M 17/00
U.S. Cl. 123—198 DB **3 Claims**



1. A fuel control valve for use with an internal combustion engine having a fuel supply circuit and an air induction system subject to subambient pressure pulses while running, said valve comprising;

a body having wall portions defining a shell-like structure and including fuel inlet and outlet ports adapted for connection in said fuel supply circuit and a control port adapted for connection to said air induction system;

valve means disposed in said body arranged for controlling flow from said fuel inlet port to said fuel outlet port, said valve means being normally biased to a closed fuel port condition and being actuatable to an open fuel port condition;

a flexible diaphragm disposed within said body operatively associated with said valve means, said diaphragm forming a movable wall of a control chamber defined in part by wall portions of said body, said diaphragm being movable in response to subambient pressure in said control chamber for actuating said valve means to said open fuel port condition;

a restricted vent passage disposed in a wall portion of said body communicating said control chamber with ambient atmosphere; and

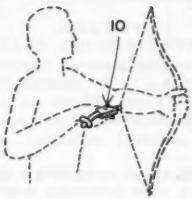
a flexible resilient one-way check valve disposed between said control chamber and said control port arranged for permitting flow from said control chamber, said restricted vent passage and said flexible resilient check valve providing means for sustaining a subambient pressure condition in said control chamber in response to recurrent subambient pressure pulses in said control port, whereby said fuel inlet and outlet ports are maintained in communication with each other while said engine is running.

3,952,720

BOWSTRING RELEASE MECHANISM

Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176

Filed Apr. 11, 1975, Ser. No. 567,056
Int. Cl.[2] F41B 5/00
U.S. Cl. 124—35 A **2 Claims**



2. A bowstring holding and release device comprising in combination:

a handle member adapted to be gripped by the human hand, holding and release means mounted on said handle for releasably engaging a bowstring, said holding and release means comprising a rotating holding member for movement between first and second position for holding and releasing a bowstring, respectively,

sear means engaging a first surface portion of said holding member to retain said holding member in said first position when said sear member is in a first pivoted position,

trigger means engaging a first end portion of said sear means to retain said sear means in a first position, when said trigger means is in a first sliding position,

said trigger means being slideable to a second position out of engagement with said portion to permit said sear means to pivot to said second position out of engagement with said surface portion of said holding member to permit said holding member to rotate to said second position for releasing a bowstring, said holding member when manually moved to said first position being engaged by said sear means and said sear means being engaged by said trigger means,

locking means for selectively holding said trigger means in first sliding position and said sear means in first pivoted position for retaining said holding member in said first position,

said locking means including biasing means for automatically sliding the trigger means back to said first position after sliding of said trigger means from said first position to said second position and an additional means for automatically pivoting said sear means back to said first position after pivoting of said sear means from said first position to said second position,

flexible rope means connected to said holding and release means and looped around a bowstring and over a second surface of said holding member,

whereby said locking means holds said holding member and said rope means around said second surface of said hold-

ing member when said trigger means and said sear means are in first positions and said bowstring is tensed and when said trigger means and said sear means move to said second position said rope means slips off of said second surface of said holding member and from around a bowstring as a bowstring moves to a released position,

trigger adjusting means limiting or increasing the engagement of said trigger means with said sear means.

3,952,721

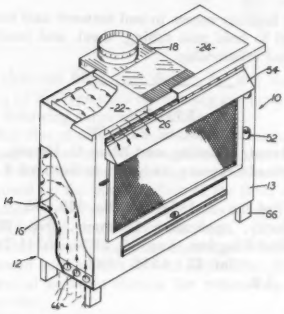
STOVE WITH COOKING PLATE

Tommy W. Patterson, P.O. Box 65, Hayesville, Ohio 44838

Filed July 10, 1974, Ser. No. 487,125

Int. Cl.² F24B *1/26;* **F24C** *15/10*

U.S. Cl. 126—63 **5 Claims**



1. A stove comprising:

a frame means including spaced inner and outer walls with the inner wall operatively defining a fire chamber,

said frame means having an air inlet means formed therein at a lower portion thereof connecting to the space between said walls,

said frame means also comprising a horizontally extending heater duct extending substantially the depth of said frame means at each end of said frame means, and connecting to the space between said walls, which ducts are positioned at the upper portion of the frame means and are open at the front of the stove for discharge of heated air, and are open at the rear of the frame means to the space between said walls to receive air flowing up between said walls, said frame means including a top section having a flat top surface with a center opening therein between said ducts and directly above the fire chamber to have the combustion products flow directly upwardly thereto, a metal plate positioned over said opening for receiving food thereon to be cooked or warmed by the stove, the combustion products contacting the lower surface of said plate and an exhaust stack operatively connected at its lower end to said frame means at a rear portion thereof at the level of said metal plate for flow of the combustion products up against said metal plate and then horizontally rearwardly to and up said exhaust stack.

3,952,722

FIREPLACE ROOM HEATER ACCESSORY

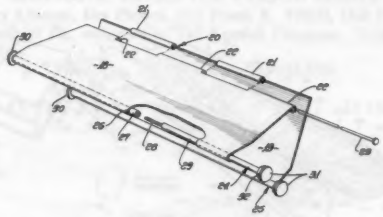
Yoshishige Yamagishi, 796 Merritt Drive, Pasadena, Calif. 91104

Filed July 17, 1974, Ser. No. 489,130

Int. Cl.² F23L *11/00;* **F24C** *15/22*

U.S. Cl. 126—141 **2 Claims**

1. A heat deflector assembly for installation in a fireplace opening defined by spaced sidewalls, a rear wall and a floor, said assembly comprising an upper sheet metal panel mounted in spaced relation to said rear wall to permit combustion gas to escape to a flue, a lower sheet metal panel joined to said upper panel to extend therefrom at downward and forward inclination overlying the fireplace heat source on said floor to deflect heat into the fireplace room and conduct heat to the upper panel, said panels having looped free edges, and mounting means separately and releasably supporting the panels against the side walls of the fireplace opening, said mounting



means comprising for each panel spaced rod sections contained within said looped free edges of the panels, said sections being threadedly interconnected for relative axial movement, one of the sections carrying a pad to bear against the fireplace sidewall by relative expansive axial adjustment of the sections.

3,952,723

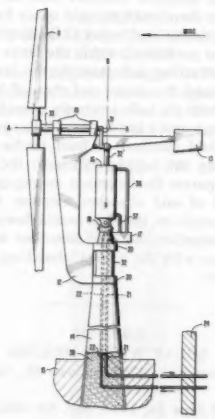
WINDMILLS

James A. Browning, Hanover, N.H., assignor to Browning Engineering Corporation, Hanover, N.H.

Filed Feb. 14, 1975, Ser. No. 549,924

Int. Cl.² F24C *9/00;* **F22B** *9/06;* **F03D** *9/00*

U.S. Cl. 126—247 **5 Claims**



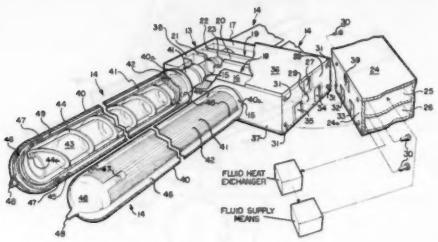
1. A system for extracting useful energy from the wind, comprising a windmill; a closed circuit containing a liquid; pump means driven by said windmill to place said liquid under pressure in said circuit; and a flow control impedance to permit a predetermined constant volumetric flow of said liquid in said circuit per unit of time and across which said pressure drops to yield heat.

3,952,724

SOLAR ENERGY CONVERTER

Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 24, 1974, Ser. No. 482,092
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 18 Claims



1. A solar energy collector apparatus comprising an outer hollow, elongated tubular member of transparent glass, closed at its one end and normally open at its other end, a hollow, elongated tubular glass absorber member defining a glass wall of lesser O.D. than the I.D. of said outer member which is closed at its one end and open at its other end, the absorber member having its exterior surface comprised of an energy absorbing coating applied thereon over a substantial portion of its axial length, said coating having high absorptivity and low emissivity, said absorber member being inserted within said outer member such that the other open end of the absorber member projects out of the other normally open end of said outer member, spring-like, snap on means engaging said closed end of the absorber member supporting it in spaced relation to the interior surface of said outer member near the closed end of the latter, an annular portion of the glass at the other normally open end of said outer member being fused annularly onto the glass wall of the absorber member, thereby sealing it to said absorber member near its other end and closing the space therebetween, said space being evacuated, a fluid handling member of lesser O.D. than the I.D. of said absorber member positioned within the latter, said fluid handling member extending substantially the length of the absorber member and the inner end thereof being open and communicating with the hollow interior of said absorber member and providing a space between the latter two members for circulation of fluid medium, a fluid media supply means, means connecting the supply means to the fluid handling member, and separate fluid conduit means connected to the other open end of said absorber member to receive fluid media flowing therefrom, the fluid media flowing between said fluid handling member and said absorber member in heat exchange relation with the energy absorbing surface of said absorber member.

3,952,725

SOLAR WATER HEATER

William B. Edmondson, 4701 Salerno St., San Diego, Calif. 92111

Filed June 24, 1974, Ser. No. 482,206
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 12 Claims

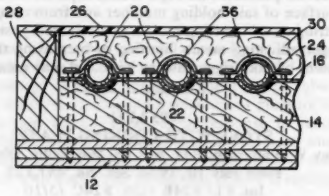
1. A method of constructing a solar fluid heater comprising the following steps:

a. placing a layer of deformable insulating material on the forward face of a panel;

b. placing a heat-conductive deformable sheet on said insulating layer;

c. placing conductive hollow tubing on said sheet;

d. pressing said tubing against said sheet and insulating layer to form a trough in said sheet beneath said tube; and



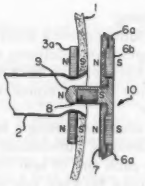
e. attaching fastener means to and between said tubing and said panel to hold said tubing, sheet, and insulation in compressed relationship.

3,952,726

MEDICAL DEVICE

Gerhard R. Hennig, Gauting, and Klaus G. Hennig, Graben-Neufeld, both of Germany, assignors to Gerhard R. Hennig, Germany

Filed Dec. 4, 1974, Ser. No. 529,586
Claims priority, application Germany, Dec. 20, 1973, 2363563; United Kingdom, Aug. 19, 1974, 36341/74
Int. Cl.² A61B 19/00
U.S. Cl. 128—1 R 5 Claims



1. In combination, means for closing the intestinal opening on an anus praeter patient, which comprises an axially magnetized ring-shaped permanent magnet means comprising at least one permanent magnet, said ring-shaped permanent magnet means being adapted to be positioned around the intestinal opening and a magnetic sealing cap means for closing the intestinal opening, said sealing cap means including a cap member adapted to contact the abdominal wall of the patient and at least one ferromagnetic material arranged to be magnetically attracted to the ring-shaped magnet when the sealing cap means is in the closed position, said sealing cap means also including an axially magnetized permanent magnetic core member extending away from said ferromagnetic material in said sealing cap means and disposed to be inside the ring-shaped permanent magnet means when the sealing cap means is in the closed position, the magnetic core member being axially magnetized in such a way as to increase the magnetic attraction between the permanent magnet means and the ferromagnetic material of the sealing cap means when the distance between the ring-shaped permanent magnet means and the ferromagnetic material of the sealing cap means is greater than a predetermined value and to decrease said magnetic attraction when said distance is less than said predetermined value, said sealing cap means being operable to close said intestinal opening by magnetic attraction to said permanent magnet means and to be manually separable from said permanent magnet.

3,952,727

VENT DEVICE FOR OSTOMY APPLIANCE

John L. Nolan, Glenview, Ill., assignor to Hollister Incorporated, Chicago, Ill.

Continuation of Ser. No. 401,337, Sept. 27, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,961
Int. Cl. A61f 5/44
U.S. Cl. 128—283 2 Claims

1. A charcoal filter vent device for use with an ostomy appliance of the type used for venting gas from an abdominal opening following surgery, comprising,

a. a filter disc of matted fibers and charcoal particles having opposite inner and outer surfaces,

b. an inner pervious film disc larger than the filter disc disposed on the inner surface of the filter disc, and positionable over a vent opening in an ostomy appliance for admitting gas to the filter disc,

c. an outer impervious cover disc larger than the filter disc, disposed on the outer surface of the filter disc, and having a central aperture therein for exhausting gas from the filter disc,

d. said inner and outer discs having outer peripheries secured together, and

e. an annular adhesive disc having an adhesive surface with an inner peripheral portion adhesively secured to an outer peripheral portion of the cover disc and an outer peripheral portion adhesively attachable to an ostomy appliance around a vent opening therein.

3,952,728

METHOD OF MEASURING DYNAMIC (A) AUDITORY AND (B) TACTILE SEQUENCING OR TRACKING, AND DIAGNOSING CEREBELLAR-VESTIBULAR DYSFUNCTION AND DYSMETRIC DYSLEXIA

Harold N. Levinson, 15 Lake Road, Great Neck, N.Y. 11020, and Jan Frank, 45 E. 82nd St., New York, N.Y. 10028

Continuation-in-part of Ser. No. 535,507, Dec. 23, 1974, abandoned. This application Feb. 24, 1975, Ser. No. 552,700
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 R 12 Claims

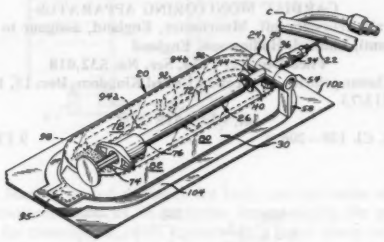
1. A group diagnostic screening procedure for identifying those in said group possibly having the condition of dysmetric dyslexia, which is based on the discoveries of a cerebellar-vestibular dysfunction and resulting impaired accoustical suppression by said cerebellar-vestibular indicative of said condition, said procedure comprising the steps of reciting words at a selected volume level and in a language known to said group for the purpose of requiring identification of said recited words by members of said group, simultaneously with the aforesaid recitation of words causing in background relation thereto auditory material to be presented to said group starting at a volume at a selected level below that of said recited words, and progressively increasing the volume level of said background auditory material while requiring said identification of said recited words by said group members, whereby any group member unable to make said identification of recited words because of improper suppression of said background auditory material is automatically identified as possibly being dysmetric dyslexic.

3,952,729

DIAGNOSTIC DEVICE FOR A LIQUID SAMPLE

Gary Libman, Des Plaines, and Frank K. Villari, Oak Park, both of Ill., assignors to The Kendall Company, Walpole, Mass.

Filed Aug. 29, 1974, Ser. No. 495,978
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 F 21 Claims



1. A diagnostic device for a liquid sample, comprising:

a receptacle having a cavity containing a culture medium;

means for establishing communication with the sample;

pump means for withdrawing and expelling liquid; and

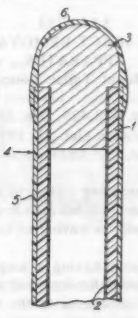
valve means for separately establishing communication of the establishing means and the receptacle with the pump means, whereby a liquid sample may be withdrawn by the pump means through the establishing and valve means and expelled by the pump means through the valve means into the receptacle for inoculation of the culture medium.

3,952,730

INSTRUMENT FOR USE IN THE MEASUREMENT OF BLOOD GASES

Alan Key, Newbury, England, assignor to National Research Development Corporation, London, England

Filed Oct. 22, 1974, Ser. No. 517,058
Claims priority, application United Kingdom, Oct. 30, 1973, 50392/73
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 G 3 Claims



1. An instrument for use in the measurement of blood gases, the instrument comprising:

a flexible catheter in the form of a nylon tube having its internal surface coated with a material which will effectively inhibit outgassing of water vapour into the interior of the tube under vacuum;

a rigid porous body extending across the whole of the end of said tube, said porous body having a first portion secured within said tube adjacent said end and having a smoothly rounded second portion projecting from said end; and

a sheath of a non-thrombogenic polymeric material part of which closely envelops said tube and part of which constitutes a gas-permeable membrane completely covering said second portion of said porous body.

3,952,731

CARDIAC MONITORING APPARATUS

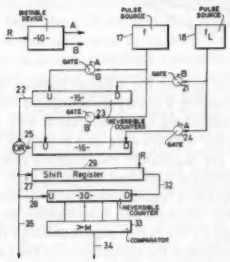
Gerald Worstencroft, Manchester, England, assignor to Ferranti, Limited, Hollinwood, England

Filed Dec. 12, 1974, Ser. No. 532,018

Claims priority, application United Kingdom, Dec. 15, 1973, 58213/73

Int. Cl.² A61B *5/04*

U.S. Cl. 128—206 A **9 Claims**



1. Cardiac monitoring apparatus comprising means for detecting normal and/or ectopic complexes in an electrocardiogram waveform, and means for comparing the intervals between successive detected complexes, the means for comparing comprising binary counting means, means for causing the binary counting means to count at different rates during successive said intervals, and means responsive to the contents of the counting means for detecting that successive said intervals differ by more than a predetermined amount.

3,952,732

ULTRASONIC CATARACT REMOVAL METHOD AND APPARATUS

John P. Shock, 83 Mount Tallac Court, San Rafael, Calif. 94903

Division of Ser. No. 318,429, Dec. 26, 1972, Pat. No. 3,857,387. This application Oct. 21, 1974, Ser. No. 516,211

Int. Cl.² A61H *23/00*

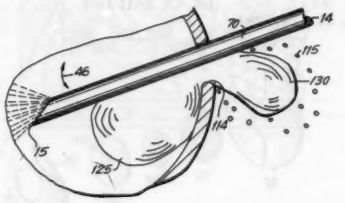
U.S. Cl. 128—24 A **17 Claims**

1. The method of removing a mass of unwanted tissue substantially intact from an enclosed area in an animal through an incision with a tool member having an output edge, comprising the steps of:

A. forming an incision having a length smaller than the largest cross-sectional dimension of the mass of unwanted tissue in an area proximate to the mass of tissue to be removed,

B. reducing the volume of the mass in its enclosed area by engaging the output edge of the tool member against the mass and ultrasonically vibrating the output edge to form at least one aperture in the mass,

C. continuously supplying a treatment fluid to the enclosed area to obtain a hydrostatic pressure differential between the enclosed area and the atmosphere, and



D. removing the reduced mass substantially intact from the incision, whereby the mass progressively alters its shape due to the reduced volume and hydrostatic pressure to conform to the length of the incision as it exits therethrough.

3,952,733

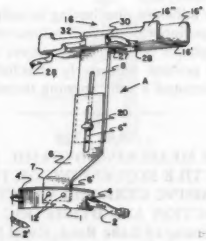
ARM SUPPORT

Ester B. Williams, 4807 Gilray Drive, Baltimore, Md. 21214

Filed Apr. 23, 1975, Ser. No. 570,739

Int. Cl.² A61F *5/40*

U.S. Cl. 128—94 **1 Claim**



1. An arm support comprising a short, flat, concave, rigid body-engaging member having an opening in each end thereof for attaching a belt thereto for encircling the waist of the wearer, a bracket section having one end thereof adapted to be fixed to the said body-engaging member along one of its flat sides, said bracket section being angled outwardly at an obtuse angle immediately above the body-engaging member, a second obtuse angle formed in the opposite direction in the said bracket section outwardly from the first obtuse angle, a second bracket section of substantially the same width and length as the first bracket section, the outer end of which is formed outwardly at an angle perpendicular to the rigid, flat, body-engaging member, an arm supporting member having a bottom and two side walls, the outer side wall being higher than the inner side wall, said bottom being fixed to the angled portion of the second section of the bracket, the second section of the bracket having a central slot therein for adjusting the same relative to the first bracket section, and a thumb screw adapted to clamp the two bracket sections in adjusted fixed position, the shorter side wall of the arm support having slots therein and means extending through said slots and adapted to extend about a part of the body of the wearer for limiting the outward movement of the arm supporting member.

3,952,734

INTRA-UTERINE-DEVICE

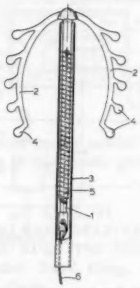
Willem Arthur Adriann Algernon Van Os, Aerdenhout, and Pieter Eduard Reinier Rhemrev, Heemstede, both of Netherlands, assignors to Multilan S.A., Fribourg, Switzerland

Filed Feb. 6, 1975, Ser. No. 547,657

Claims priority, application Netherlands, Feb. 14, 1974 7402008

Int. Cl.² A61F 5/46

U.S. Cl. 128—130 5 Claims



1. Intra-uterine-device meant to be inserted into the uterus, comprising an elongated stem, carrying at one end two resilient, canti-levered arms, extending sideways on either side of the stem, which stem is contained within a tube shaped sheath by means of which the device may be inserted into the uterine cavity through the cervix, after which the sheath may be pulled back, characterized in that, the sheath narrowly encloses the stem, whereas the shape and flexibility of the arms are choosen in such manner that the arms, when passing the cervix, are pressed together onto the outer surface of the sheath by the cervix wall, said arms, when relaxed after insertion, curving back towards said stem so that they substantially form a portion of an ellipse, the longer axis of which coincides with said stem.

3,952,735

EYE BANDAGE

Jonathan D. Wirtschafter, 1147 Athenia Drive, Lexington, Ky. 40504; Juan L. Zauberman, 26 Ben Maimon St., and Samuel Moscowitz, c/o School of Applied Science, Hebrew University of Jerusalem, both of Jerusalem, Israel

Filed May 27, 1975, Ser. No. 580,885

Int. Cl.² A61F 13/12

U.S. Cl. 128—163 19 Claims

1. An eye bandage for protecting the eye of a patient comprising a unitary, flexible outer cover panel and a pneumatic cushion centrally positioned on the outer cover panel and formed of a flexible thin impervious material for defining at least one air cell having a flexible wall positioned adjacent the eye of the patient, said cover panel having adhesive surface portions laterally adjacent the cushion for attachment to the facial surface surrounding the eye of the patient.

3,952,736

HAND-OPERATED BODY CARE APPLIANCE

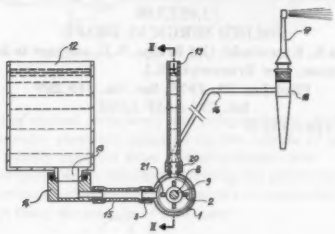
Michel Antoine Moret, Chene-Bourg, Gva; Pierre-Jean Jousson, Geneva, and Jean-Pierre Musy, Puplinge, Gva, all of Switzerland, assignors to 4 P Limited, United Kingdom

Filed Dec. 19, 1974, Ser. No. 534,380

Claims priority, application Switzerland, Dec. 21, 1973, 17991/73; Dec. 21, 1973, 17992/73

Int. Cl.² A61H 9/00

U.S. Cl. 128—66 17 Claims



1. Hand-operated appliance for body care by means of an intermittent liquid jet, in particular for massaging the gums and for cleaning the teeth, comprising: a liquid pump which comprises a working chamber, an outlet pipe connected to said working chamber, a piston reciprocable axially therein and driven by an electric motor, an inlet chamber, an inlet pipe connected to said inlet chamber, and an inlet valve located in the connecting aperture between the inlet chamber and working chamber, which valve is closed at the time of the working stroke of the piston and opened at the time of the suction stroke; a liquid reservoir connected to the inlet pipe; a spray nozzle connected to the outlet pipe; and a stop valve actuated by the user for opening and closing the pipe leading to the spray nozzle aperture, and wherein the inlet valve is constructed and arranged such that is assumes its open position in the inoperative position, when the pump is switched off.

3,952,737

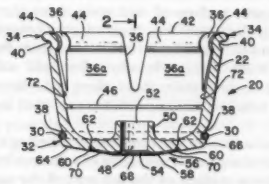
CONTRACEPTIVE

Donald E. Lipfert, Woolwich, Maine; Seymour L. Romney; Robert Zeidman, both of Mamaroneck, N.Y., and Willfred Goldschmidt, Greenwich, Conn., assignors to The Medevice Company, Greenwich, Conn.

Filed Aug. 28, 1974, Ser. No. 501,060

Int. Cl.² A61F 5/46

U.S. Cl. 128—127 45 Claims



1. A contraceptive device for positioning in relation to the cervix of the uterus, comprising a body portion, means for holding said body portion to the cervix, and closure means to close the entrance of the cervix from the inflow of material; said closure means comprising valve means comprising at least one opening in said body portion, stretchable diaphragm means including valve gate means and port means, biasing

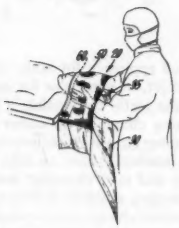
means for biasing said diaphragm means against said body portion with said diaphragm valve gate means against said body portion opening and with said diaphragm port means in offset relationship to said body portion opening; wherein said valve means open upon the application of internal pressure from within the uterus and close upon application of external pressure from without the uterus, to permit the outflow of material under pressure from the uterus and prevent the inflow of material into the uterus.

3,952,738

FOLDED SURGICAL DRAPE

Henrietta K. Krzewinski, Old Bridge, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 29, 1975, Ser. No. 545,289
Int. Cl.² A61F *13/00*
U.S. Cl. 128—132 D **11 Claims**



1. A surgical drape comprising:

a. a main sheet of flexible, drapable material, said main sheet having an upper surface and a lower surface, a top edge, a bottom edge, and opposed side edges, an upper portion adjacent said top edge and a remainder portion adjoining said upper portion; said upper portion comprising a top part and a bottom part, said top part of said upper portion being not larger than said bottom part of said upper portion, said top part joining said bottom part along a first line running transversely of said main sheet;

b. a cuff overlying the upper surface of said upper portion of said main sheet, said cuff having a top edge, a bottom edge, and opposed side edges, said cuff being integral with said main sheet along the respective top edges of said cuff and said main sheet, said cuff being further secured to the upper surface of said main sheet along generally longitudinally extending lines of attachment which are spaced inwardly a substantial distance from the side edges of said main sheet, whereby, after said cuff has been attached to said main sheet along said lines of attachment, a hand receiving pocket is provided in said drape; and

c. a strip of adhesive for removably adhering the drape to the body of a patient, said strip of adhesive being secured to the lower surface of the top part of the upper portion of said main sheet,

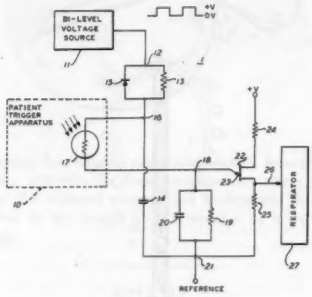
said drape being folded longitudinally at least two times, the first fold being made by forward folding said top part around said first transverse line; the second fold being made by reverse folding the drape around a line extending transversely of the drape and through said remainder portion whereby, when the folding is completed, a longitudinally folded drape is provided which is reduced in length and wherein said adhesive is exposed on the upper surface of the folded drape.

3,952,739

FAIL SAFE SYSTEM FOR A PATIENT TRIGGERED RESPIRATOR

Anthony B. Cibulka, Poynette, Wis., assignor to AIRCO, Inc., Montvale, N.J.

Filed Oct. 21, 1974, Ser. No. 516,567
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **11 Claims**



1. A fail safe system for preventing erroneous inspiratory operation of a respirator during the expiratory phase of a patient respiratory cycle comprising:

means for supplying a potential during the expiratory phase of said respiratory cycle;

sensing means coupled to said potential means for detecting an inspiratory effort of a patient during said expiratory phase;

threshold means connected to said sensing means for producing an output signal for activating said respirator in response to said sensing means detecting said inspiratory effort;

circuit means connected to said sensing means and to said threshold means for precluding the production of said output signal in response to said sensing means detecting said inspiratory effort before a predetermined portion of said expiratory phase has elapsed; and

means coupled to said threshold means and said sensing means for inhibiting production of said output signal upon said sensing means detecting an inspiratory effort at the start of said expiratory phase.

3,952,740

GAS FLOW MONITOR FOR ANESTHETIC MACHINES

James E. Scurlock, Fort Devens, Mass., assignor to The United States of America as represented by the National Institute of Health, Washington, D.C.

Filed May 12, 1975, Ser. No. 576,581
Int. Cl.² A61M *16/00*
U.S. Cl. 128—145.8 **8 Claims**

1. In an anesthetic machine including a source of pressurized anesthetic gas and a source of pressurized respiratory gas, a gas flow monitor comprising:

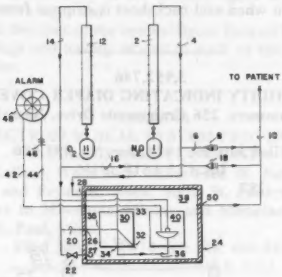
A fluidic OR/NOR gate having a power stream input connected to said source of anesthetic gas and a control stream input connected to said source of respiratory gas and having an OR output leg and a NOR output leg;

A breathing circuit for a patient connected to said OR output leg of said fluidic gate;

Said anesthetic gas and said respiratory gas being mixed in said fluidic gate and the resulting gas mixture flowing through said OR output leg thereof and into said breathing circuit, when the flow rate of said respiratory gas in said control stream is sufficiently great;

An alarm means connected to said NOR output leg of said

fluidic gate, for manifesting an alarm signal when a reduction in flow rate of said respiratory gas in said control



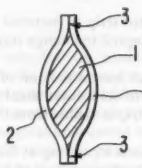
stream causes said power stream to flow through said NOR output leg of said fluidic gate.

3,952,741

CONTROLLED RELEASE DELIVERY SYSTEM BY AN OSMOTIC BURSTING MECHANISM

Richard William Baker, Bend, Oreg., assignor to Bend Research Inc., Bend, Oreg.

Filed Jan. 9, 1975, Ser. No. 539,637
Int. Cl.² A61M 7/00; B65D 35/08
U.S. Cl. 128—260 14 Claims



1. A water actuated osmatic type active agent dispenser including a means for dispensing a dosage of active agent into an aqueous fluid or humid environment comprising (1) a fluid permable membrane defining at least a part of a walled enclosure, said enclosure containing therein an active agent which exhibits an osmatic pressure upon exposure of the enclosure to the environment, the thickness and permibility of said membrane comprising a means for controlling the water diffusion therethrough until the osmotic pressure in the enclosure is sufficient to distort, stretch and finally rupture the enclosure resulting in release of the agent to the environment.

3,952,742

NEEDLE-CARRIED, TRANSTHORACIC, CANNULA-TYPE CARDIAC RESUSCITATION INSTRUMENT

Duane F. Taylor, 680 Winter St., SE., Salem, Oreg. 97301

Filed June 12, 1974, Ser. No. 478,790
Int. Cl.² A61M 25/00; A61N 1/04
U.S. Cl. 128—172.1 13 Claims

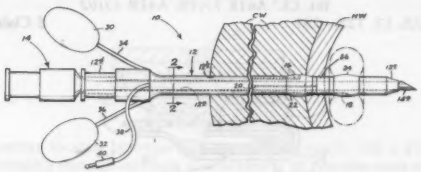
1. A transthoracic, cannula-type cardiac resuscitation instrument comprising

an elongated catheter needle, or the like, of a certain length,

an elongated flexible tube having distal and proximal ends, and including, extending along its length which is less than said certain length, wall means defining an elongated double-open-ended passage for accommodating the slidable and removable reception therein of said needle, with said needle when received therein being circumferentially surrounded by said tube with an end of said needle projecting axially from said distal end of the tube,

means mounted on the outside of said tube defining an exposed electrically conductive expanse adjacent but inwardly of the tube's distal end,

conductor means connected to said expanse for operatively connecting said expanse to electrical pacing apparatus,



a pair of spaced, selectively and independently changeable-geometry elements mounted on the outside of said tube on axially opposite sides of said expanse, and

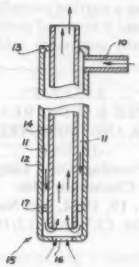
means operable for selectively altering the geometry of each element by changing each element's overall radial projection from the outside of said tube.

3,952,743

SUCTION DEVICE

John Young Harrison, Sydney, Australia, assignor to Unisearch Limited, New South Wales, Australia

Filed Mar. 25, 1974, Ser. No. 454,765
Claims priority, application Australia, Mar. 28, 1973, 2780/73
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 2 Claims

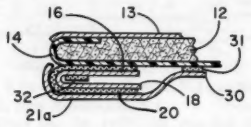


1. A suction device for medical purposes comprising inner and outer concentric tubes, each having first and second ends, wherein the first end of said outer tube is formed with an orifice for receiving unwanted tissue and the second end thereof comprises a transverse end wall through which the inner tube protrudes, and the first end of the inner tube is located within the outer tube adjacent the orifice and the second end thereof is located externally of the outer tube and is adapted to be connected to suction means, liquid inlet means being provided in the outer tube adjacent said wall, and a swirl member being provided between said inner and outer tubes and between said inlet means and said orifice, said first end of said outer tube comprising a second transverse end wall a short distance beyond the first end of said inner tube and in which said orifice is located, said second wall limiting said orifice to an area in alignment with said inner tube and having a cross-section no greater than the cross-section of said inner tube, so that when suction means is applied to the second end of said inner tube liquid traveling from the second to the first end of the outer tube is given a swirling motion by said swirl member and then sucked into said inner tube without emerging from said first end of said outer tube.

3,952,744
TAPE ATTACHMENT SYSTEM FOR DISPOSABLE DIAPERS

Karl E. Aldinger, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Mar. 28, 1975, Ser. No. 562,926
Int. Cl.² A61F 13/16; A41B 13/02
U.S. Cl. 128—287 5 Claims

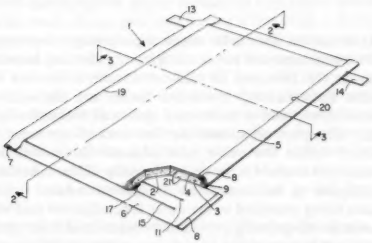


1. In a tape fastening system for a disposable diaper which has pressure-sensitive adhesive fastening tapes disposed at opposite corners of one end thereof for fastening the diaper about the waist, wherein said diaper comprises an absorbent core disposed between a bottom backing sheet and a top body-contacting cover sheet, wherein said tape has pressure sensitive adhesive on one surface, and wherein one end portion of said tape has a surface permanently attached to said backing sheet near one corner of the diaper and an opposite non-adhering surface the other end portion of the tape is free and has a length to extend beyond the edge of said diaper, the improvement comprising a means for holding said tape wherein said free end portion is folded back over the attached end portion of said tape with the non-adherent surfaces of the tape in contact and the pressure sensitive adhesive surface of said folded-over free end portion is releasably covered by an elongate release-coated protective sheet, a section of said protective sheet having a portion extending beyond the folded portion of said tape and a terminal portion of said protective sheet being permanently secured to said backing sheet.

3,952,745
DISPOSABLE DIAPER HAVING READILY FLUSHABLE ABSORBENT MEDIA AND IMPROVED PAD INTERGRITY IN USE

Robert C. Duncan, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 19, 1974, Ser. No. 525,254
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 8 Claims

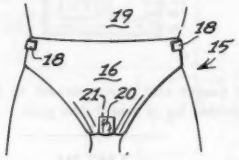


1. In a disposable diaper having a liquid-retaining backsheet, a liquid-absorbent pad comprised of a liquid-absorbent media contained within an envelope of wet strength tissue superimposed on said liquid-retaining backsheet and a liquid-pervious topsheet secured in superposed relation to said liquid-absorbent pad and said liquid-retaining backsheet, the improvement which comprises attachment means for securing at least a portion of said wet strength tissue envelope located adjacent said liquid-retaining backsheet directly to said backsheet, said attachment means and said liquid-retaining backsheet having greater strength than said wet strength tissue envelope, whereby said wet strength tissue envelope is ruptured to provide exposure of the liquid-absorbent media contained therein when said backsheet is stripped from said diaper.

3,952,746
HUMIDITY INDICATING DIAPER COVER

F. Wayne Summers, 256 Craigmeade Drive, Nashville, Tenn. 37214

Filed July 29, 1974, Ser. No. 492,686
Int. Cl.² A61F 13/16
U.S. Cl. 128—287 7 Claims

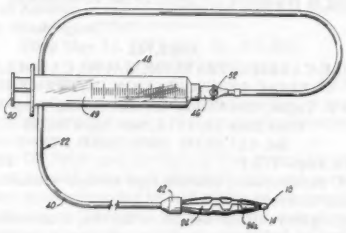


1. A humidity indicating diaper comprising:
a. an outer sheet of material substantially impervious to liquid, having an outer face and an inner face,
b. an inner sheet of liquid-absorbing material against the inner face of said outer sheet,
c. a hole extending through said outer sheet from said outer face to said inner face and in liquid communication with said inner sheet,
d. a moisture indicator strip of material impregnated with a chemical agent adapted to change state in the presence of moisture,
e. means mounting at least a portion of said indicator strip on the outer face of said outer sheet so that said portion of said indicator strip is visible from the outer face of said outer sheet,
f. said mounting means mounting at least a portion of said indicator strip in registry with said hole for communication with liquid through said hole.

3,952,747
FILTER AND FILTER INSERTION INSTRUMENT

Garman O. Kimmell, Jr., 3125 N. Virginia, Oklahoma City, Okla. 73118

Filed Mar. 28, 1974, Ser. No. 455,582
Int. Cl.² A61B 17/00
U.S. Cl. 128—303 R 19 Claims



7. A filter for filtering solid and semi-solid materials from a liquid moving axially in a cylindrical vessel, said filter comprising:
at least six resilient wire legs of substantially equal length positioned in conical array symmetrically about a central axis, each of said legs having at least two spaced U-shaped

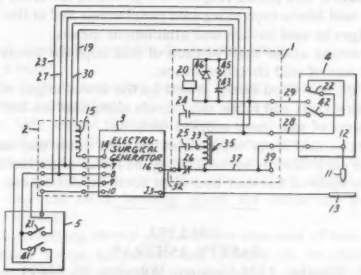
bends intermediate the length thereof, with the two bends forming together the configuration of a letter W, that portion of each leg which is in, and forms, said bends, lying substantially in the conical figure formed by the collective legs; and

a hub at the apex of the conical figure formed by the collective legs and having an end of each of the legs secured thereto.

3,952,748
ELECTROSURGICAL SYSTEM PROVIDING A FULGURATION CURRENT

Paul L. Kaliher, White Bear Lake; Fred W. Nelson, Cottage Grove, and Bryan K. Roos, North St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 18, 1974, Ser. No. 489,519
Int. Cl.² A61B *17/36;* **A61N** *3/02*
U.S. Cl. 128—303.14 **3 Claims**



1. A fulguration adaptor for enabling an electrosurgical system including a solid state generator for providing a cut mode electrosurgical current waveform of RF electric energy having a first voltage amplitude to an active electrode terminal to which an electrosurgical instrument is connected during use of the system, to alternatively provide a fulguration mode current waveform from the generator to the active electrode terminal,

said adaptor comprising

transformer means for enabling the generator to provide a fulguration mode waveform having a second higher voltage amplitude;

switching means connected to the transformer means for selectively connecting the transformer means to the generator for providing said fulguration mode waveform, for disconnecting the transformer means from the generator, and for switching off the current from the generator when operated to disconnect the transformer means; and

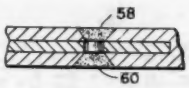
delay circuit means connected to the switching means for delaying said disconnection of the transformer means until after the current from the generator has been switched off.

3,952,749
BOX LOCK SURGICAL INSTRUMENT

John Fridolph, Berlin, N.J.; Robert Wilson, Dresher, and Rodney Kulp, Harleysville, both of Pa., assignors to Pilling Co., Fort Washington, Pa.

Division of Ser. No. 469,967, May 15, 1974, Pat. No. 3,911,766. This application May 7, 1975, Ser. No. 575,353
Int. Cl.² A61B *17/28;* **B21K** *11/06;* **B25B** *7/06*
U.S. Cl. 128—321 **4 Claims**

1. A box lock surgical instrument comprising first and second members each having, at one end, operative means adapted to cooperate with the operative means of the other member, and each having at its opposite end manipulable means for controlling the movement of the operative means on the said member, the first member having a bifurcated portion at an intermediate location whereby its operative means and its manipulable means are connected by two separate elements having a slot between them and the second member extending through said slot with its operative means and its manipulable means on opposite sides of said bifurcated portion, a hole extending through the portion of the second

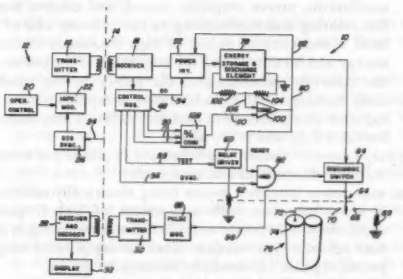


member located between said separate elements, and a pin extending through said hole and welded at its opposite ends to said separate elements, said pin being welded, at each of its opposite ends, to one of said separate elements throughout a weld zone which extends through at least 75% of the thickness of said one of said separate elements.

3,952,750
COMMAND ATRIAL CARDIOVERTING DEVICE

Mieczyslaw Mirowski, Owings Mills; Morton M. Mower, Baltimore, both of Md., and Alois A. Langer, Pittsburgh, Pa., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Filed Apr. 25, 1974, Ser. No. 464,180
Int. Cl.² A61N *1/36*
U.S. Cl. 128—419 D **30 Claims**

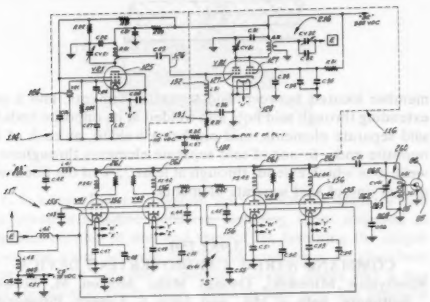


8. A system for cardioverting a heart experiencing supraventricular cardiac rhythm, said system being controlled directly by the wearer and external to the skin of the wearer, and comprising: a cardioverting unit implanted beneath the skin of the wearer including a storage element for receiving and storing predetermined amounts of energy for converting an abnormal supra-ventricular cardiac rhythm to normal sinus rhythm, electrode means associated with said storage element and the heart of the wearer for delivering the stored energy to the atrium for converting the heart, switch means for enabling the discharge of the stored energy into the atrium upon storage by said storage means of said predetermined amounts of energy, charging means for delivering said predetermined amounts of energy to the storage element, means for disabling said charging means once said storage element has stored said predetermined amounts of energy, and a receiver for receiving commands from external to the skin of the wearer, for controlling the operation of said switch means and for initiating the discharge of the stored energy into the atrium in response to such commands; and a portable transmitter external to the skin of the wearer and operated by said wearer upon said wearer's sensing of a condition requiring cardioversion of the atrium, for transmitting command signals across the skin to said receiver for controlling the operation of said implanted cardioverting unit.

3,952,751
HIGH-PERFORMANCE ELECTROTHERAPEUTIC APPARATUS

Frank A. Yarger, Harbor City, Calif., assignor to W. Denis Kendall, Los Angeles, Calif.

Filed Jan. 8, 1975, Ser. No. 539,283
Int. Cl.² A61N 1/40
U.S. Cl. 128—422 **8 Claims**



1. Improved electrotherapeutic apparatus comprising

a. an electromagnetic energy radiating head including primary and secondary coils and a capacitor electrically connected across the secondary coil,

b. and input circuit means connected with the primary coil of the head and including a source of high frequency oscillations, power amplifier means, and control means for creating and transmitting to the primary coil of the head a sequence of pulses of high frequency electrical energy and for controlling the amplitude of the pulses and the intervals therebetween, the pulses having substantially rectangular shape and having a repetition rate and duration characterized in that they define a duty factor of between 0.35 and 0.55, where

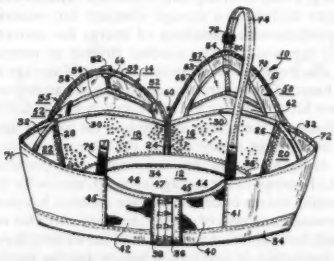
(duty factor) = (pulse repetition rate in pulses per second) × (pulse duration in micro seconds)

c. said power amplifier means being electrically connected in series sequence with said source of high frequency oscillations, said power amplifier means including at least four ceramic type vacuum tubes having parallel outputs producing said substantially rectangular pulses.

3,952,752
SUSPENSION BRASSIERE

Frank Huttle, Jr., 530 Pratt St., Hammonton, N.J. 08037

Filed Aug. 7, 1974, Ser. No. 495,317
Int. Cl.² A41C 3/00
U.S. Cl. 128—486 **4 Claims**



1. A suspension brassiere comprising an inner support section, and an outer cup section;

said inner section including two breast support panels joined at the inner edges thereof along a medial seam,

two side panels respectively joined at the inner edges thereof to the outer edges of said breast support panels along panel seams;

separate stretch and brassiere attachment means joined to the outer edges of said side panels for completing the body encircling brassiere when used;

a narrow, elongated elastic band extending along and joined by seams directly to the lower edges of said support and side panels and of said stretch and attachment means, said elastic band being extensible along the length thereof and substantially inextensible and resistant to folding along the width thereof so as to provide a yieldable body-encircling anchor band for said support panels;

a separate angular suspension strip having ends connected to the respective outer edge seam of the associated one of said support panels and to said medial seam;

and a separate shoulder strap connected to the apex of each of said suspension strips;

said outer cup section icluding two separate fabric cups joined at the inner edges thereof along a medial seam separated from said inner support section, and at the outer edges thereof to said support panels along the associated panel seams,

two fabric side panels respectively joined at the inner edges to said fabric cups along said panel seams and at the outer edges to said stretch and attachment means;

and means at the apex of each of said cups for connecting to one of said shoulder straps;

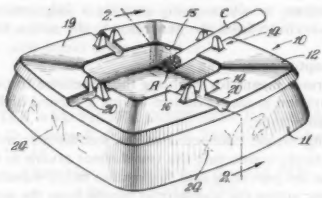
said anchor band being joined to the lower edges of said fabric cups and fabric side panels along said anchor band seams of said inner support section;

whereby said inner support section and outer cup section are each directly secured along the lower edges thereof to the body of the user and there retained during use.

3,952,753
SAFETY ASHTRAY

Josef F. Klingler, 1335 Gregory, Wilmette, Ill. 60091

Continuation of Ser. No. 409,708, Oct. 25, 1973, abandoned.
This application Feb. 10, 1975, Ser. No. 548,245
Int. Cl.² A24F 19/14
U.S. Cl. 131—235 R **13 Claims**



1. A safety ashtray comprising:

cup-shaped wall means integrally defining a well for receiving ashes from a conventional cigarette, an outer periphery, and a segmentally cylindrical upwardly opening channel for receiving the lower longitudinal extending segmentally cylindrical portion of the cigarette with a lighted end thereof overlying said well;

pincer means integrally upstanding from said wall at opposite sides of said channel and spaced substantially equidistantly outwardly from said well and inwardly from said outer periphery for compressively retaining an inserted portion of the cigarette to retain the portion of the cigarette between said pincer means and well on said wall means in said channel for causing extinguishing of the burning portion as it contacts said wall means in the channel and for providing an effectively positive snuffing action on the burning portion in the event it is not extinguished by said contact with the wall means in the channel before reaching said pincer means; and

a base portion removably secured to said wall means outwardly of said pincer means and formed of a relatively soft plastic material for effectively wall scratching and

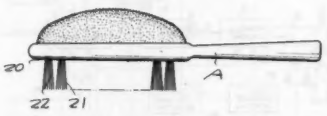
similar deformation of a surface on which the ashtray may be set.

3,952,754

DANDRUFF REMOVING DEVICE

Yoshiaki Kondo, 1-12, Sakuranocho-5, Toyonaka, Osaka, Japan

Filed June 6, 1974, Ser. No. 477,034
Int. Cl.² A45D *24/16*
U.S. Cl. 132—120 7 Claims



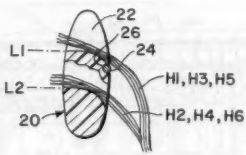
1. A dandruff removing device comprising
   a. a body,
   b. a particle removing portion having a curved configuration comprising:
      a light weight thin metal plate,
      a chemical film layer coated thereon, and
      electrostatic means including short lengths of synthetic resin filaments set in the outer surface of said portion by use of a binding agent for attracting particles thereto,
   c. a mounting thread engraved on one side of said device body so as to permit said portion to be detachably mounted on said mounting thread,
   d. a plurality of holes bored on the other side of said device body, and
   e. substantially long lengths of synthetic resin filament bristles inseparably set in said other side of the device body through said holes substantially in a normal direction with respect to said device body.

3,952,755

HAIR DRESSING APPARATUS AND METHOD

Karol C. Fisher, Penthouse East, 183-11 Hillside Ave., Queens, N.Y. 11432

Filed Dec. 26, 1974, Ser. No. 536,609
Int. Cl.² A45D *24/00*
U.S. Cl. 132—161 1 Claim



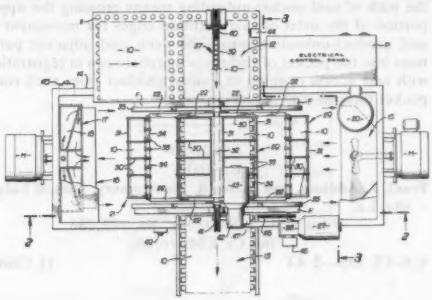
1. In a comb of the class described having teeth arranged in pairs, with shallow roots between some of the pairs and deep roots between the teeth of the other pairs, said roots connecting the inner portions of the teeth, the improvement comprising:
   a recess extending longitudinally along a side face between the tops of the shallow roots and the tops of the deep roots and a removeable wire member adapted to fit into the recess.

3,952,756

SEMI AUTOMATIC PARTS CLEANING MACHINE

Richard H. Sheppard, Rancho Palos Verdes, Calif., assignor to Purex Corporation, Lakewood, Calif.

Filed June 14, 1974, Ser. No. 479,203
Int. Cl.² B08B *3/04*
U.S. Cl. 134—133 3 Claims



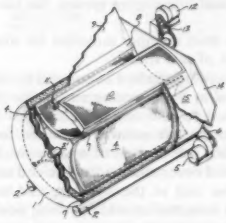
1. Apparatus operable to clean parts by movement through a tank-contained liquid cleaning solution, comprising
   a. a revolving carrier immersed in the solution and having a transverse axis of rotation,
   b. parts receiving cages each permeable by the cleaning solution and mounted on said carrier to travel through the agitated solution to a parts loading and unloading position above the liquid,
   c. said cages having open sides through which the parts are loaded and unloaded along a transverse path from one side to the opposite side of the carrier,
   d. stationary means in the tank operable to block movement of the immersed parts out of the open sides of the cages, said means comprising arcuate barriers extending at opposite sides of the cages substantially throughout the parts movement through the tank solution,
   e. each cage defining a transverse slot at its radially outer side, and
   f. there being a series of pushers carried by and spaced along an endless power driven element to move in succession and transversely through successive of the cage slots to displace the parts into and out of the cages through the open sides thereof, at said parts loading and unloading position.

3,952,757

ROTARY PROCESSING APPARATUS

John A. Huey, 830-84th Ave. NE., Bellevue, Wash. 98004

Filed Mar. 19, 1974, Ser. No. 452,703
Int. Cl.² B08B *3/00*
U.S. Cl. 134—134 10 Claims



1. Processing apparatus comprising a processing chamber having an upper access opening, a spider rotor mounted for rotation about a generally horizontal axis and having a plurality of radiating partitions dividing said rotor into a plurality of circumferentially spaced pockets between adjacent partitions,

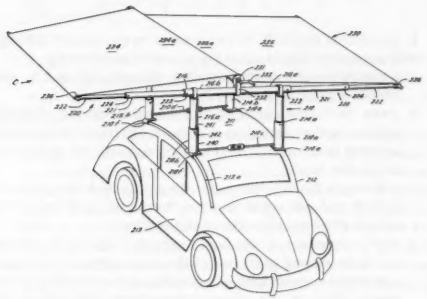
respectively, the outer edges of said partitions being movable through an orbit by rotation of said rotor, product-unloading means guided for movement downward along a path crossing the upper portion of the orbit of said partition edges and through said access opening, and means for rotating said spider rotor and for positioning said spider rotor with adjacent partitions thereof located at opposite sides of that portion of the path of said pocket-unloading means crossing the upper portion of the orbit of said partition edges for movement of said product-unloading means between said adjacent partitions into the pocket of said rotor therebetween in registration with said access opening to unload product from such rotor pocket through said access opening.

3,952,758

CANOPY

Frank F. Addison, and James B. Montgomery, both of Lafayette, La.

Filed Sept. 3, 1971, Ser. No. 177,786
Int. Cl. E04f *10/00*
U.S. Cl. 135—5 AT **11 Claims**



1. A retractable canopy adapted to be mounted on a vehicle and extendable sidewardly from opposing sides thereof, comprising:

a. a frame adapted to be mounted on top of said vehicle, said frame having opposing side sections and including a plurality of outer casing members transversely mounted on each of said opposing side sections;

b. telescoping means slidably mounted in each outer casing member to provide a plurality thereof on each opposing side section of said frame for telescoping between a retracted position where said telescoping means are disposed substantially in said outer casing members, and an extended position, where said telescoping means extend outwardly from opposing sides of said vehicle and are supported by said casing members; and

c. a cover means mounted on said frame and connected to each of said telescoping means, the cover means including:

1. a first shaft member mounted for rotation on one side section of said frame;

2. a first cover attached at one end to the first shaft member and at the opposing end to the telescoping means mounted on said one side section;

3. a second shaft member mounted for rotation on the opposing side section of said frame; and

4. a second cover attached at one end to said second shaft member and at the opposite end to the telescoping means mounted on said opposing side section, whereby said first and second covers are respectively wound on said first and second shaft members in said retracted position and are respectively unwound from said shaft members in said extended position from opposing sides to provide a canopy for said vehicle;

d. vertically extendable mounting means for mounting said telescoping means on said frame; and

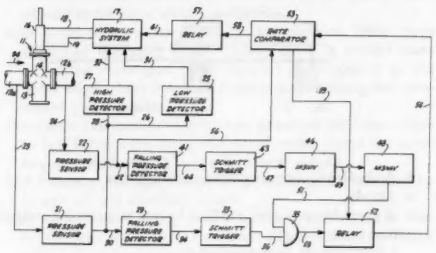
e. means for extending said mounting means whereby the height of said telescoping means and said cover means above the top of said vehicle is controlled.

3,952,759

LIQUID LINE BREAK CONTROL SYSTEM AND METHOD

Sidney Allan Ottenstein, Spring, Tex., assignor to M & J Valve Company, Houston, Tex.

Filed Aug. 14, 1974, Ser. No. 497,248
Int. Cl.² F16K *31/00*
U.S. Cl. 137—12 **20 Claims**



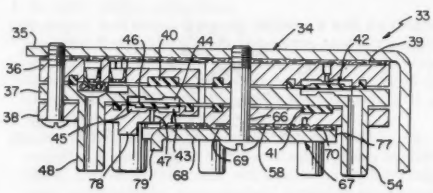
1. In a method for controlling the operation of a valve controlling fluid flow in a pipeline to close the valve in the event of a leak or break in the line, the steps of: monitoring the static fluid pressure in the pipeline to detect the occurrence of a negative pressure wave originating on the downstream side of the valve, distinguishing said wave from a like wave originating on the upstream side, monitoring the rate of static pressure drop on the downstream side in the event that a negative pressure wave originating on that side of the valve is detected, and closing the valve in the event that the pressure on the downstream side decreases faster than a predetermined rate after the negative pressure wave is detected.

3,952,760

MULTIPLE LOW PRESSURE SELECTOR RELAY AND METHOD OF MAKING THE SAME

Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 25, 1975, Ser. No. 607,354
Int. Cl.² G05D *11/58*
U.S. Cl. 137—82 **11 Claims**

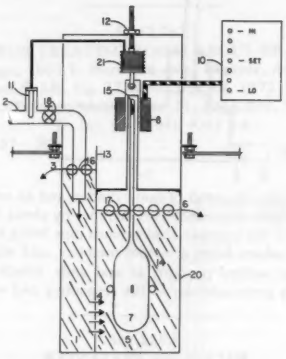


1. In a multiple low pressure selector relay having a housing means provided with a plurality of low pressure relays each having an exhaust port, the improvement comprising movable selector means carried by said housing means and having means for closing all of said exhaust ports except two thereof when said selector means is in one position thereof, said selector means having said means opening other of said exhaust ports when said selector means is moved to other positions thereof whereby the desired number of exhaust ports in addition to said two thereof can be opened.

3,952,761
SYSTEM FOR CONTROLLING DENSITY OF LIQUIDS

Donald Friedland, 3619 Bedford Ave., Brooklyn, N.Y. 11210

Filed Mar. 25, 1974, Ser. No. 454,667
Int. Cl.² G01N *9/18*
U.S. Cl. 137—91 **7 Claims**



1. An apparatus for determining the density of a liquid sample from a processing unit which comprises:

a first chamber and a second chamber for holding liquid sample from said processing unit,

said second chamber having a finned hydrometer adapted to freely rotate in sample liquid contained therein,

said first chamber having a liquid overflow passage, and said second chamber having a liquid overflow passage, the overflow passage of said first chamber being at a higher elevation than that of said second chamber,

said first chamber and said second chamber being separated by a wall having openings provided therein so as to cause liquid to flow as a plurality of lateral streams from said first chamber to said second chamber,

means for feeding sample liquid from said processing system to said first chamber,

the aforesaid means causing liquid to flow from said first chamber laterally into said second chamber in the form of a liquid stream entering said second chamber in the form of a liquid stream entering said second chamber at about a height corresponding to the position of the body of the finned hydrometer so as to turn said finned hydrometer, and

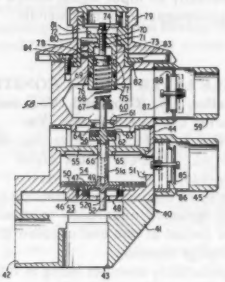
means for sensing the relative height of said hydrometer so as to indicate the density of the sample liquid.

3,952,762
ANAESTHETIC INFLATION VALVES

Wilfred Jones, 155 Bradford Road, Riddlesden, Keighley, Yorkshire, England (BD20 5JH)

Filed May 14, 1974, Ser. No. 469,634
Claims priority, application United Kingdom, May 17, 1973, 23546/73
Int. Cl.² F16K *15/14*
U.S. Cl. 137—102 **6 Claims**

1. An inflation valve for controlling flow of fluid from an inlet to a work outlet and from the work outlet to exhaust, said valve comprising: an inlet valve seat; an inlet valve member having an input face to which incoming fluid is directed, part of said input face being engageable with said inlet valve seat, and an output face; a restricted passageway connecting a first space on the input face side of the inlet valve member to a second space on the output face side of the inlet valve member; an exhaust valve seat; an exhaust valve member having a first face engageable with said exhaust valve seat and capable of being exposed to pressure in one of said first and said second spaces, and a second face exposed to exhaust pressure; work outlet connection means for receiving input fluid from said second space and for directing fluid for exhaust to said first face of said exhaust valve member; and mechanical connecting means between said inlet and exhaust valve members, said mechanical connecting means and the relationship between the surface areas of said faces of said valve members

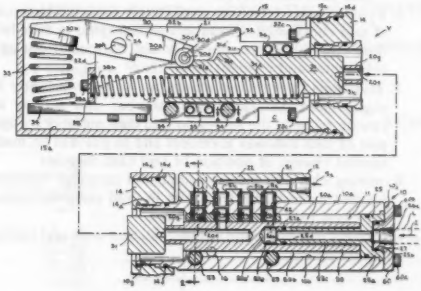


being such that when the pressure differential between said first and second spaces is above a given value said exhaust valve member is held closed and said inlet valve member is held open to allow fluid to flow from said inlet to said work outlet, but when said pressure differential falls below said given value said inlet valve member is closed and said exhaust valve member is opened to allow fluid to flow from said work outlet to said exhaust.

3,952,763
SEQUENCE CONTROL VALVE

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Filed Apr. 29, 1974, Ser. No. 464,771
Int. Cl.² B15B *13/06*
U.S. Cl. 137—119 **16 Claims**



1. A valve for providing various predesignated output signals in response to selected pressure levels of a fluid input signal from a remote signal source, comprising:

a housing connectable to a remote input signal source for providing a fluid input signal at selected, different pressure levels, each of which pressure levels is associated with a different valve position;

position responsive means mounted in said housing for movement from a first position to any desired position of a plurality of other positions in response to an input signal pressure level associated with said desired position;

cam means operably engaging said position responsive means for allowing movement of said position responsive means from said first position to any desired position of said plurality of other positions only in response to the

selected pressure level of said plurality of different input signal pressure levels which is associated with said desired positions;

output signal means operably connected to said position responsive means for directin fluid from said signal source to form a predesignated output signal in response to the position of said position responsive means as determined by the selected pressure levels of said fluid input signal, whereby an input signal source is used to provide various predesignated output signals.

3,952,764

SINGLE LEVER FAUCET CONSTRUCTION

Robert J. Keller, III, Richmond, Va., assignor to Kel-Win Manufacturing Co., Inc., Chester, Va.

Filed June 19, 1974, Ser. No. 480,848
Int. Cl.² F16K *11/14*
U.S. Cl. 137—119 **24 Claims**

1. A single lever mixing faucet construction comprising:

a. a fixedly mounted underbody member having an open-mouthed socket at one end adapted to receive a removable cartridge therein,

1. said underbody member being in fluid communication with sources of hot and cold water,

b. a removable cartridge member at least partially received in said socket of said underbody member,

c. means for retaining said removable cartridge member in said socket of said underbody member,

d. said removable cartridge member comprising:

1. a cartridge housing member,

2. a cam member mounted within said cartridge housing member for substantially universal motion about a pair of intersecting axes,

3. means for moving said cam member manually about said pair of intersecting axes,

4. first cam restraining means serving to prevent outward movement of said cam member,

5. second cam restraining means serving to prevent inward movement of said cam member, said second cam restraining means comprising:

i. at least three cam follower members engageable with said cam member,

6. a pair of valve members respectively actuated by a pair of said cam follower members and adapted to establish fluid communication between said sources of hot and cold water and a spigot,

7. said third cam follower member being constantly in engagement with said cam member and serving to counterbalance the forces on said cam member by said pair of cam follower members and to prevent an inadvertent change of position of said cam member,

8. mixing chamber means within said cartridge member located downstream from and in fluid communication with said pair of valve members,

e. and spigot means in fluid communication with said mixing chamber means.

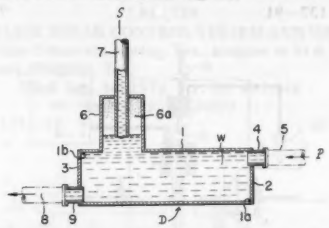
3,952,765

DEVICE FOR SEPARATING AIR BUBBLES OF FLUIDS IN PIPING, AND SILENCING WATER FLOW

Shinichi Kimura, 5-34, 5 jo, Misono, Toyohira, Sapporo, Hokkaido, Japan

Filed Dec. 4, 1974, Ser. No. 529,459
Int. Cl.² B01D *19/00*
U.S. Cl. 137—171 **6 Claims**

1. A device for separating air bubbles from a fluid flow and for silencing sound carried from the fluid flow into a pipe system which includes a pump-side and a consumer-side pipe and respective fittings thereat, the device comprising a hollow cylinder which is large in comparison with the cross-sectional measurements of said pipes in the system, said cylinder having respective inlet and outlet ends as well as end walls in parallel alignment with each other at said ends, said pump-side pipe being connected to an upper region of one end wall, and said consumer-side pipe being connected to a lower region of another end wall, a cylinrical air-cushion member protruding on the top of said cylinder at a position nearer to said outlet end than to said inlet end, the height of said member being



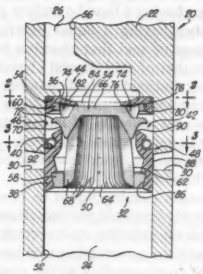
greater than the diameter of said cylinder, and an exhaust pipe protruding from above into said member by about ⅛ to 4/5 of said height of the member, said exhaust pipe being surrounded by an air cushion formed in said member, and wherein said cylinder has welded portions at said ends, which are made substantially perpendicular to the respective end walls.

3,952,766

BACKFLOW PREVENTER

Dwight N. Johnson, Anaheim, Calif., assignor to JH Industries, Inc., Santa Ana, Calif.

Filed Aug. 13, 1974, Ser. No. 497,111
Int. Cl.² F16K *24/00*
U.S. Cl. 137—218 **20 Claims**



1. A backflow preventer comprising a housing having a bore therein including inlet and outlet portions separated by an intermediate zone, vent passage means extending from said intermediate zone, a unitary and relatively rigid body member in said bore overlying said vent passage means, spaced first and second valve seats defined on said body member adjacent said inlet and outlet portions respectively, a first resilient valve member having a first portion held between said body member and the wall of said bore and having a movable second portion engageable with said first valve seat to define a first check valve for flow from said inlet portion to said intermediate zone, a second resilient valve member having a first portion held between said body member and the wall of said bore and having a movable second portion engageable with said second valve seat to define a second check valve for flow from said intermediate zone to said outlet portion, said first valve member including a third movable portion engageable with the wall of said bore adjacent said vent passage means.

12. A cartridge assembly adapted to be inserted into and frictionally retained in a bore in order to form a backflow preventer, said cartridge assembly comprising:

a rigid, one-piece body member of generally spool-shape including a spaced pair of annular rims and a generally cylindrical portion extending axially between said rims;

passage means defining a flow path extending through said body;

first and second valve seats defined by said body in spaced positions along said flow path; and

first and second resilient valve members each including a first portion encircling one said rim and a second portion engageable with one said valve seat.

3,952,767

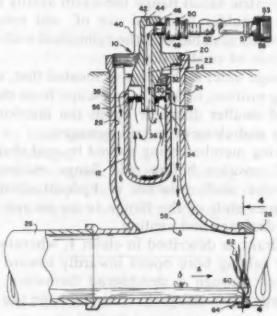
MEANS FOR TREATING ROOTS ABOUT DRAIN LINES

Fred Farage, 1002 E. Northern Ave., Phoenix, Ariz. 85020

Division of Ser. No. 272,030, July 14, 1972, Pat. No. 3,830,659. This application June 21, 1974, Ser. No. 481,521

Int. Cl.² B08B 9/04

U.S. Cl. 137—268 1 Claim



1. Means for treating roots about drain lines, comprising: a male fitting having peripheral structure adapted to fit a generally tubular female plumbing cleanout structure; a hollow chemicals container coupled to said male fitting and normally suspendingly supporting said container therebelow; said container having a closed bottom and sidewall structure extending upwardly from said bottom; said sidewall structure having an overflow outlet opening therein; said overflow outlet opening being spaced substantially above said bottom; and water inlet means coupled to said male fitting and disposed for introducing water into said chemicals container; said male fitting at said peripheral structure is provided with screw threads adapted screwthreadably to engage conventional internal screwthreads of a female plumbing cleanout structure; said threads comprising a plurality of groups of screw threads; each group of screw threads being of a different pitch diameter; said groups diametrically stepped relative to each other; one of said group of threads having the largest pitch diameter; another of said groups of threads having the smallest pitch diameter; the group having the smallest pitch diameter being closest to a normally lower end of said container.

3,952,768

BRAKE MEANS FOR AN AIR-POWERED SPRINKLER SYSTEM

Loren R. Townsend, Sidney, Nebr. 69162

Filed Jan. 10, 1975, Ser. No. 540,114

Int. Cl.² B05B 3/12

U.S. Cl. 137—344 15 Claims

1. A self-propelled sprinkling apparatus commprising,

a water supply pipe moveable about a central pivot point,

a plurality of spaced-apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled,

an air operated drive means on each of said towers to propel said towers and said supply pipe about said central pivot point,

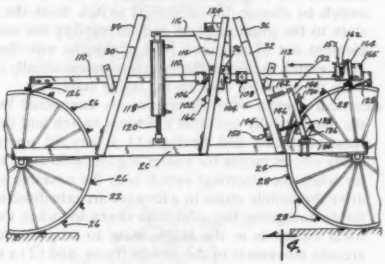
a source of compressed air for supplying air under pressure to said drive means,

control means on said towers for controlling the operation of said drive means so that said towers will be selectively driven to maintain said supply pipe in an aligned condition as said pipe is moved about said central pivot point,

each of said drive towers comprising at least a pair of wheels,

and a brake means on at least one of said towers which selectively moves into braking engagement with at least one of said wheels on said one tower to prevent the said tower from undesirable rolling.

said tower comprising a frame means having the said pair of wheels mounted thereon, a trojan bar means reciprocata-



bly mounted on said frame means and moveable between first and second positions for engagement with at least one of said wheels for driving said wheel when said trojan bar means moves in at least one direction,

said drive means including means operatively connected to said trojan bar means for reciprocating said trojan bar means,

said brake means comprising means normally maintained in braking engagement with said one wheel,

and brake release means for selectively moving said means out of braking engagement with said one wheel when said trojan bar means is moving in at least said one direction.

3,952,769

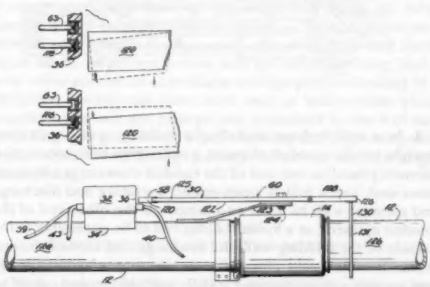
ALIGNMENT CONTROL APPARATUS FOR CENTER PIVOT IRRIGATION EQUIPMENT

Eduard Karl Ott, Bothell, Wash., assignor to Frontier Machinery Company, Walla Walla, Wash.

Filed Nov. 13, 1976, Ser. No. 523,225

Int. Cl.² B05B 9/02

U.S. Cl. 137—344 9 Claims



1. Alignment control apparatus for a self-propelled center pivot irrigation system having a plurality of pipe sections pivotally interconnected to form an elongated multi-joint water distribution conduit, with each pipe section being supported by a respective mobile frame having a reversible electric drive motor thereon to propel the mobile frame in reversible arcuate paths about one end of the conduit, in which the alignment control apparatus maintains the pipe sections in

general longitudinal alignment as the conduit is pivoted in the arcuate paths, comprising:

an enclosure associated with a pipe section;

a solid state contactor mounted in the enclosure and electrically connected to the electrical motor for applying electrical power to the electric motor to propel the pipe section;

a magnetically operable electrical switch mounted in the enclosure having a stable state and an unstable state;

a movable magnetic element generating a magnetic field;

means responsive to the pivotal movement of the adjacent section about a common joint for moving the magnetic element into magnetic field alignment with the electrical switch to change the electrical switch from the stable state to the unstable state and for moving the magnetic element out of magnetic field alignment with the magnetic switch to permit the switch to automatically change from the unstable state to the stable state;

electrical control network operatively connected between the magnetically operable electrical switch and the solid state contactor and having (1) a forward operational mode circuit means for energizing the solid state contactor when the electrical switch is in the unstable state to drive the mobile frame in a forward arcuate direction and for de-energizing the solid state contactor when the electrical switch is in the stable state to stop the forward arcuate movement of the mobile frame, and (2) a reverse operational mode circuit means for energizing the solid state contactor when the electrical switch is in the stable state to drive the mobile frame in a reverse arcuate direction and for de-energizing the solid state contactor when the electrical switch is in the unstable state to stop the reverse arcuate movement of the mobile frame.

3,952,770

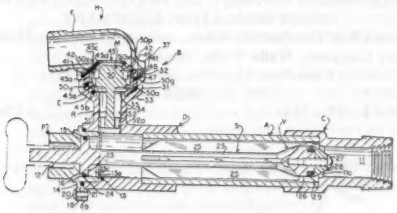
NON-FREEZE WALL HYDRANT WITH VACUUM BREAKER

Irlin H. Botnick, 3155 Kersdale, Pepper Pike, Ohio 44124

Filed Dec. 17, 1973, Ser. No. 425,503

Int. Cl.² F16K *24/00*

U.S. Cl. 137—360 **9 Claims**



1. In a wall hydrant including a building wall penetrating straight tubular conduit element, a water pipe inlet connection element joined on one end of the conduit element as a hydrant inner end, and a hollow open-ended operating and discharge end element with its inner end joined on the other end of the conduit element, as a hydrant outer end to be accessible at the outside of the building wall, the discharge end element having a lateral outlet, said element *s* constituting a hydrant body, and a water valving member axially shiftable in and out of an inlet passage closing position at a valving bore of said inlet element for opening and closing the hydrant, the structure comprising:

operating shaft means extending through and axially shiftably supported in said body to shift axially said valving member in and out of said closing position,

a closure element secured to and sealed in the other, outer, end of said discharge element as a plug and providing an end wall with a threaded central aperture coaxially aligned with the conduit element and said valving bore and having said shaft means threaded therethrough to be rotationally operated to effect axial shifting,

said closure element and said discharge element defining a valving recess between the location of said outlet and end wall,

said recess comprising two hollow cylindrical wall portions of different diameters and joined through a circumferential wall shoulder, with at least that cylindrical wall portion having the smaller diameter being coaxial with said shaft means, air inlet and drainage outlet passages running to the hydrant exterior, opening at the plug outer end, and having passage inner ends opening in said recess at circumferentially spaced wall locations therein,

said shaft means including

a concentric radial flange therewith axially shiftable past said shoulder into and out of, and rotationally and slideably sealable with the cylindrical wall of, the recess portion of smaller diameter,

said passage inner ends being so located that, upon hydrant closing motion, radial flange escape from the recess portion of smaller diameter opens the interior of said discharge end element to said passages;

said valving member being moved by said shaft means to a closed position before said flange escape; whereafter continued shaft rotation in hydrant closing direction continues shift of the flange to an escape enabling hydrant drainage and venting.

9. A hydrant as described in claim 1, wherein

the said valving bore opens inwardly toward said conduit element through a shouldered formation of said inlet element surrounding the flow path to the conduit element,

said shoulder formation being provided with an apertured valving seat facing said valving bore;

said valving member comprises a shuttle-like element axially slideable in the valving bore to and from a valve closing position with one end sealingly engaging said valving seat,

said shuttle-like element with a surrounding cylindrical surface of the valving bore defining flow space from the inlet connection to the apertured seat; and

said operating shaft means includes a push-rod extending co-axially through said conduit element and engageable with said one end of the shuttle element to displace it axially from said seat, and to hold it displaced in an open position against forces urging it back to closed position.

3,952,771

RELIEF VALVES WITH PILOT VALVES

Armin Lang, Schwabisch Gmund-Bettringen, Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany

Filed May 29, 1975, Ser. No. 581,978

Claims priority, application Germany, Jan. 8, 1975, 2500537; Jan. 8, 1975, 2300480

Int. Cl.² F16K *31/383*

U.S. Cl. 137—491 **24 Claims**

1. A relief valve having pilot valve control comprising:

a housing having an inlet passage and an outlet passage and a pressure chamber;

a relief valve intermediate said passages and disposed in said housing so as to be exposed to inlet pressure opening force from said inlet passage and closing pressure force in said pressure chamber;

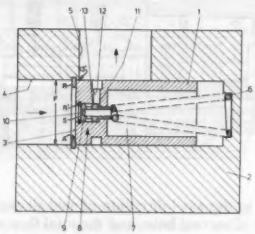
restricted flow means for providing the inlet pressure of said inlet passage in said pressure chamber;

a pilot valve means comprising means effecting differential area surfaces;

means whereby said surfaces are exposed to inlet passage pressure in opposed directions wherein one surface is

larger to effect an opening force when subjected to predetermined inlet pressure to actuate said pilot valve means;

said pilot valve means being thus movable and responsive to predetermined inlet pressure and being connected to vent said pressure chamber so that the reduction in closing pressure force on said relief valve permits opening



thereof by inlet passage pressure to relieve pressure in said inlet passage;

a spring in said pressure chamber biasing said pilot valve means to closed position and means whereby said spring has reaction support to effect closing bias on said relief valve.

3,952,772

INTAKE PIECE ADAPTED FOR EMPTYING CONTAINERS WITH LIQUID

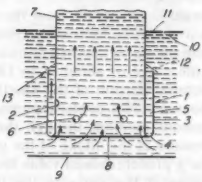
Hendrik Kaarsmaker, Herrjansdam, Netherlands, assignor to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 5, 1973, Ser. No. 404,067

Claims priority, application Netherlands, Oct. 9, 1972, 7213653

Int. Cl.² E03B *11/16*

U.S. Cl. 137—565 **3 Claims**



2. In a system for discharging liquid from a container portion of a vessel, said container portion having a top and a floor, said system comprising liquid pumping means connected to an inlet suction tube extending substantially vertically into said container from the top of said container, the tube having an open lower end adjacent the floor of said container, the improvement comprising at least one second tube situated exteriorly of said inlet tube and having a lower end and an upper end and open at both said upper and lower ends, the lower end of said second tube being in fluid flow communication with the interior of said inlet tube through a first port adjacent to and spaced from said open end of said inlet tube and disposed in the wall of said inlet tube, said second tube extending upwardly from said first port to said open upper end at a level above said first port and adjacent said floor of said container to define a second port permitting fluid flow communication between the interior of the second tube and the space surrounding said second tube.

3,952,773

BREATHING GAS SUPPLY CONTROLLER

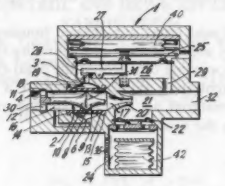
Rainer Hahn, Afrade, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

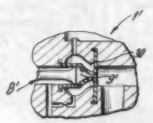
Filed Jan. 20, 1975, Ser. No. 542,511

Claims priority, application Germany, Jan. 29, 1974, 2404062

Int. Cl.² F16K *19/00*

U.S. Cl. 137—604 **5 Claims**





1. A breathing gas supply controller, comprising a housing having a gas inlet, a gas supply opening spaced from said inlet, an interior gas passage extending from said inlet to said gas supply opening and having an intermediate widened portion, an elastic valve tube in said gas passage widened portion and separating said widened portion into an annular pressure chamber around the exterior of said elastic valve tube from a central flow passage portion within the interior of said valve tube, a valve member having an annular intermediate portion of maximum diameter engageable against the interior of said valve tube in a closed position closing off said gas passage, a control chamber defined in said housing having a first control passage communicating with the prressure chamber and having a second control passage communicating from said control chamber to said gas passage on the gas supply opening end of said valve member downstream of said valve member, a one-way flow atmospheric connection into said passage on the gas opening side of said valve member, and diaphragm valve control means in said control chamber and connected to said first control passage to vent said pressure chamber to permit inflation of said elastic valve tube and opening of said gas passage upon separation of the valve tube from the valve member, said valve member comprising a forward valve portion of cone-shaped configuration extending from said maximum diameter portion toward said gas supply opening, and a rear valve portion of cone-shape configuration extending in a direction toward said valve inlet, and an intermediate piece positioned in said gas passage and connected to the wall surrounding said gas passage of said housing and supporting said valve member and having openings therein for the flow of gas therethrough.

3,952,774

ELECTRICALLY OPERATED MINI-VALVE

Stanely M. Loveless, Oshtemo Township, Kalamazoo County, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.

Filed Jan. 24, 1975, Ser. No. 543,822

Int. Cl.² F16K *11/02*

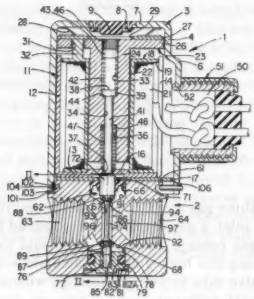
U.S. Cl. 137—625.5 **11 Claims**

1. In an electrically responsive valve assembly having a valve housing and an axially movable valve unit wherein one end of said valve unit is accessible from the exterior of said valve housing, the improvement comprising:

a pair of telescoped oppositely facing cup-shaped housings each having an axially elongated cylindrical sidewall, the outer of said cup-shaped housings having the free end of the sidewall thereof fixedly connected to said valve housing, and the sidewall of the inner cup-shaped housing being concentrically disposed within and axially movable relative to the sidewall of said outer cup-shaped housing;

an annular spool-shaped receptacle having an annularly arranged solenoid winding thereon, said receptacle being coaxially positioned within said inner cup-shaped housing;

the sidewall of said inner cup-shaped housing being positioned closely adjacent and in surrounding relationship to said solenoid winding throughout the axial extent thereof, said latter-mentioned sidewall being of a magnetically conductive material so as to guide the magnetic flux generated by the solenoid winding;



resilient pressure means backed against said outer cup-shaped housing and bearing against said annular receptacle for urging said receptacle against the bottom of said inner cup-shaped housing and thereby urging said inner cup-shaped housing into a limit position determined by said valve housing;

a plunger coaxially movably supported within said annular receptacle;

movable actuator means carried by said plunger for contacting and bearing against the exposed end of said valve unit when said solenoid winding is in one condition of energization or de-energization, and return means effective to urge said actuator means away from said valve unit when said solenoid winding is in the other condition of energization or de-energization.

3,952,775

ELECTROMAGNETIC CHANGE-OVER VALVE

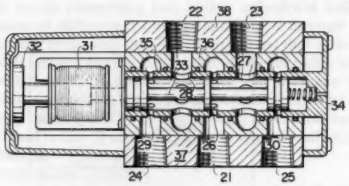
Syunshi Ogata, Koshigaya, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 558,474, March 14, 1975, abandoned, which is a continuation of Ser. No. 395,112, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 190,941, Oct. 20, 1971, abandoned. This application Apr. 8, 1975, Ser. No. 566,088

Int. Cl.² F16K *11/07, 47/00*

U.S. Cl. 137—625.38 **5 Claims**

1. A spool-sleeve type valve including an axially elongated sleeve having a plurality of annular rows of holes extending therethrough, a spool located within and being displaceable through said sleeve in the axial direction thereof, said spool having spaced apart lands on its outer surface with the dimension of each of said lands in the axial direction of said sleeve at least equal to the axial dimension of a corresponding one of said rows of holes and being displaceable across said ones of said rows of holes from one side to the other thereof for varying the direction of flow between adjacent pairs of said rows of holes, said rows of holes including rows of first holes and rows of second holes alternating with said rows of first holes with the lands on the outer surface of said spool being displaceable across said rows of first holes from one side to the other, said holes in said rows of first holes having a smaller



dimension in the axial direction of said sleeve than said holes in said row of second holes and the total flow area of the holes in each of said row of first holes traversed by said land on said spool being at least 25% smaller than the total flow area of the holes in the adjacent said rows of second holes.

3,952,776

FLUID FLOW DEVICE

James F. Eversole, Mamaroneck, N.Y., and Lester P. Berriman, Irvine, Calif., assignors to Dresser Industries, Inc., Dallas, Tex.

Continuation-in-part of Ser. No. 151,373, June 9, 1971, Pat. No. 3,778,038, which is a continuation-in-part of Ser. No. 17,086, March 6, 1970, abandoned. This application Aug. 16, 1973, Ser. No. 388,761

Int. Cl.² F15D *1/04, 1/02, 1/10, 1/00*

U.S. Cl. 138—39 **2 Claims**

1. A device for delivering a gaseous medium to utilization equipment having variable pressure conditions at its intake comprising, in combination, means defining a gaseous medium intake zone connecting with means defining a variable area throat zone for constricting the flow of the gaseous medium to increase the velocity thereof to sonic, means for adjustably varying the area of the throat zone in correlation with operating demands imposed upon the utilization equipment, and wall means downstream from the throat zone arranged to provide a gradually increasing cross-sectional area substantially corresponding to that of a conical section having an apex angle in the range of about 6° to 18° for efficiently recovering a substantial portion of the kinetic energy of the high velocity gaseous medium as static pressure whereby the velocity of the gaseous medium through the throat zone is sonic when the pressure at the intake of the utilization equipment is at or below a predetermined value less than the gaseous medium pressure at the entry to the intake zone and substantially more than 60% thereof.

3,952,777

HOLLOW BODY FOR HEATED GASES

Klaus Uhlig, Zurich, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

Filed Dec. 18, 1973, Ser. No. 425,882

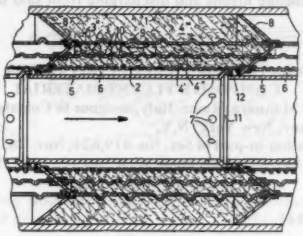
Claims priority, application Switzerland, Dec. 20, 1972, 018588/72; Germany, Dec. 29, 1972, 2264354

Int. Cl.² F16L *9/18, 9/22*

U.S. Cl. 138—149 **7 Claims**

1. A hollow body for heated gases which are subjected to positive pressure comprising a rotationally symmetrical external wall and a spaced perforated partition wall which extends substantially parallel to said external wall within said hollow body; heat-insulating material completely filling the intermediate space between said external wall and said partition wall; and at least one perforated intermediate wall in said interme-

diate space and situated substantially parallel to said external wall and said partition wall, the intermediate wall being embedded in said insulating material and sub-dividing said inter-



mediate space into layer chambers, the throttling effects of said perforated partition and intermediate walls increasing from wall to wall outwardly from the inside of said hollow body.

3,952,778

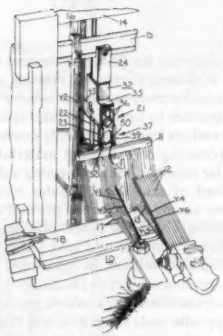
SELVAGE FORMING DEVICE

Richard L. Volpe, Hopedale, Mass., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1975, Ser. No. 572,212

Int. Cl.[2] D03D 7/00

U.S. Cl. 139—54 **1 Claim**



1. Apparatus for forming a leno selvage along the edge of fabric being woven on a loom having harnesses extending widthwise of the loom that are vertically movable for crossing sheets of warp threads to form warp sheds for the reception of weft yarn, said apparatus comprising:

a. first and second elongated carrier members mountable on adjacent harness frames;

b. first and second means mounted for sliding movement on said first and second carrier members;

c. biasing means interconnecting said first and second sliding means and continuously urging said sliding means away from each other;

d. first selvage thread guide means mounted in a preselected position on one of said first and second sliding means;

e. second selvage thread guide means mounted on the other of said sliding means, said second thread guide means being mounted for pivotal movement between an innermost and an outermost position;

f. means operatively associated with said second selvage thread guide means to cause pivotal movement thereof between said innermost and outermost positions when the said one of said sliding means on which said second selvage guide means is mounted slides on said elongated carrier members which includes:

1. a roller member assembled to the lower arm of said double armed lever with said roller member being disposed in operative association with a cam surface integrally formed on one of said elongated carrier members.

3,952,779

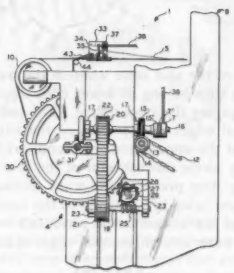
TENSION CONTROL AND DRIVE APPARATUS FOR A FABRIC LOOM

Rudolfs Kodis, Greenville, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Oct. 17, 1974, Ser. No. 515,548

Int. Cl.[2] D03D 49/10, 48/18

U.S. Cl. 139—110 **3 Claims**



1. A tension control apparatus for use on a fabric loom having a let-off beam with a plurality of warp threads wrapped thereon, said apparatus comprising:

a. power means;

b. speed reducing drive means operably connecting said power means to a let-off beam of a loom to selectively drive same, said drive means includes an electrically actuated clutch to selectively effect driving of said let-off beam:

c. a base member adapted to engage a plurality of warp threads and has an upstanding member with indicia thereon, an indicator is movably mounted on said upstanding member and is operable to indicate tension in a thread cooperating therewith;

d. a switch cooperating with said indicator and selectively actuatable thereby, said switch is operably connected to said clutch for actuation thereof, said switch is selectively movable relative to said indicator for adjusting the amount of thread tension required to actuate said switch; and

e. means cooperating with said base member to prevent same from moving with said warp threads.

3,952,780

FABRIC STABILIZING APPARATUS DISPOSABLE AT THE INPUT OF THE WEFT BEAT-UP ZONE OF TRAVELLING-WAVE SHEDDING LOOMS

Dalibor Sejbal; Vitezslav Vasek; Zbynek Miks, and Karel Prazak, all of Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny ustav bavlsnarsky, Usti nad Orlici, Czechoslovakia

Filed Sept. 19, 1974, Ser. No. 507,566

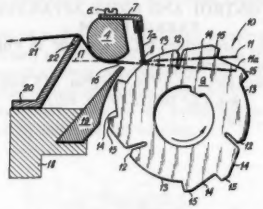
Claims priority, application Czechoslovakia, Oct. 24, 1973, 7316-73

Int. Cl.[2] D03D 49/00, 47/26; D03J 1/22

U.S. Cl. 139—291 R **9 Claims**

1. In an apparatus for stabilizing the fabric within the weft beat-up area in a travelling-wave shedding loom, wherein the beat-up is effected by means of a rotary reed, the apparatus

having means forming a stabilization slot, and a deflection rail downstream of said means, the top portion of said deflection rail lying above the level of the weaving plane, the means forming the stabilization slot including an upper delimitation rail having a lower edge and fixed on a continuous crossbar along the weaving plane, and a lower rail, the improvement wherein the upper delimitation rail is an elastic stabilizing strip secured at its upper edge to the crossbar, the elastic stabilizing strip being disposed generally above the rotary reed at the



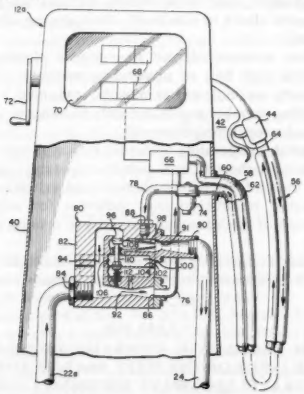
input portion of the said zone wherein the weft is beaten up, the stabilizing strip having its lower edge disposed above and resiliently engaging the upper shed warp ends and the outer circumferential edges of the discs of the rotary reed at the intersection of the upper shed warp ends with the outermost disc periphery circle downstream of the fabric fell, whereby the stabilizing strip prevents the warp threads of the upper shed sheet from being lifted owing to the tension of the warp threads and of the woven fabric produced in the front edge zone over the outer circumferential edges of the rotary reed.

3,952,781

LIQUID DISPENSING AND VAPOR RECOVERY SYSTEM AND A VAPOR FLOW CONTROL UNIT USED THEREIN

Trueman W. Hiller, and Klaus D. Jarr, both of Bettendorf, Iowa, assignors to Weil-McLain Company, Inc., Davenport, Iowa

Filed Jan. 27, 1975, Ser. No. 544,376
Int. Cl.² B67D *5/04*
U.S. Cl. 141—46 **13 Claims**



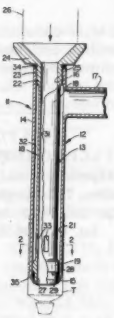
1. A control unit for use in a liquid dispensing and vapor recovery system, said unit comprising a housing having first and second inlets for receiving liquid and vapor, respectively, and first and second outlets for discharging liquid and a mixture of liquid and vapor, respectively, first passage means in said housing connecting said liquid inlet and said liquid outlet, second passage means in said housing for diverting a portion of said liquid from said first passage means, said second passage means registering with said second inlet and said second outlet, means disposed in said second passage means for continuously changing the flow rate of liquid through said second passage means in proportion to changes in the flow rate of liquid through said first passage means, and means for drawing vapor through said second inlet and into said second passage means in proportion to the flow of liquid through said second passage means, said liquid and said vapor combining in said second passage means and discharging from said second outlet.

3,952,782

APPARATUS FOR FILLING CONTAINERS WITH COMPOSITE FLUENT MATERIAL

Giuseppe Mannara, Rome, Italy, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 419,624, Nov. 28, 1973, Pat. No. 3,881,529. This application Mar. 5, 1975, Ser. No. 555,634
Int. Cl.² B67C *3/02*; B05B *7/00*
U.S. Cl. 141—100 **10 Claims**



1. A nozzle assembly for filling containers with fluent materials arranged in desired composite relation comprising longitudinally coextensive inner and outer tubular members removably secured together to form an annular space therebetween, said tubular members being threadedly connected at one end, means for introducing a first fluent material into one end of the inner tubular member, means forming a discharge opening at the other end of said inner tubular member, said inner tubular member having an enlarged portion adjacent its other end slidably fitting within the outer tube, means for introducing a second fluent material into said space, means providing a plurality of spaced orifices in said inner tubular member providing communication between said space and the interior of said inner tubular member, resilient sealing means between the tubes at opposite ends for preventing fluent material from leaving said annular space except through said orifices and axially aligned material flow modifying means disposed upstream of said orifices.

3,952,783

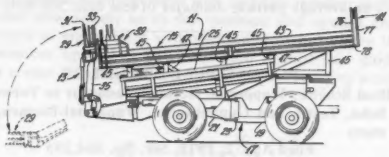
METHOD AND APPARATUS FOR HARVESTING TREES

Robert N. Windsor, Cowie Road Aspley, Brisbane, Australia (Q. 4034)

Filed June 19, 1975, Ser. No. 589,154
Claims priority, application Australia, Feb. 6, 1975, 488/75
Int. Cl.² A01G *23/08*
U.S. Cl. 144—3 D **15 Claims**

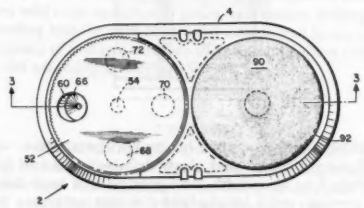
1. A method of processing trees comprising:
a. holding the trunk of a felled tree adjacent the butt end thereof;
b. delimbing a first portion of the trunk, said first portion being defined by said butt end and a first predetermined point along the trunk of the tree;
c. severing a first bolt defined generally by said butt end and said first predetermined point;
d. releasing the hold on the trunk adjacent said butt end;
e. holding the undelimbed portion of the tree at a second predetermined point spaced from the butt end of said portion toward the top end thereof;

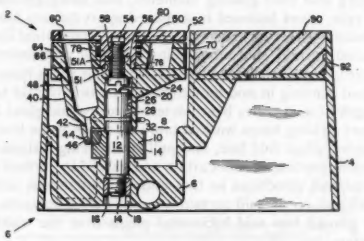
f. delimbing a second portion of the tree trunk, said second portion being defined by the butt end of said portion and a point adjacent said second predetermined point; and



g. severing a second bolt corresponding generally to the second delimbed portion.

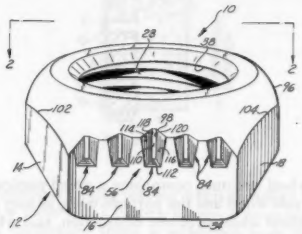
3,952,784
PENCIL POINTER
Donald L. Holland, Statesville, N.C., assignor to Hunt Manufacturing Co., Philadelphia, Pa.
Filed Apr. 16, 1975, Ser. No. 568,479
Int. Cl.² B43L *23/00*
U.S. Cl. 144—28.1 **2 Claims**





1. A pencil pointer comprising:
a base,
a cylindrical cutter mounted on the base,
a rotatable pencil holder coaxial with the cutter,
first guide means on said holder having an opening to guide the lead to a position adjacent the cutter,
second guide means rotatably mounted above said first guide means and having a plurality of selectable openings of different diameters adapted to be rotated into registry with said first guide means,
detent means to hold the second guide means in a selected position, and
third guide means overlying the second guide means, fixedly secured to the pencil holder and having an opening coaxial with the first guide means opening and having a diameter at least as large as the diameter of the largest opening in the second guide means.

3,952,785
LOCKNUT
Adalbert Werner, Plettenberg, Germany, assignor to The Lamson & Sessions Co., Cleveland, Ohio
Filed Dec. 2, 1974, Ser. No. 528,848
Claims priority, application Germany, May 30, 1974, 2425897
Int. Cl.² F16B *39/284*
U.S. Cl. 151—21 B **12 Claims**

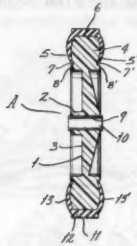


1. A locknut comprising a metallic nut body having a plurality of intersecting side surfaces, an arcuate crown end portion extending between said side surfaces at one end of said nut body, and a bottom end portion extending between said side surfaces at an end of said nut body opposite from said one end, said nut body defining a threaded central opening with noncircular thread convolutions adjacent to the crown end portion of said nut body to interfere with a mating thread convolution and circular thread convolutions adjacent to said bottom end portion of said nut body to freely engage the mating thread convolution, said noncircular thread convolutions being formed by plastically displacing the metal of the nut body to form a plurality of series of longitudinally extending indentations in a pair of side surfaces disposed on opposite sides of said nut body, each series of indentations extending from one edge portion of an associated side surface of said nut body to the opposite edge portion of the associated side surface of said nut body, each of said indentations having an end surface which extends inwardly and upwardly from the associated side surface of the nut body at a location adjacent to an axially inner end of said noncircular thread convolutions and between said crown and bottom end portions, a substantially flat inner surface which extends upwardly from said end surface and intersects said crown end portion of the nut body, said inner surface sloping inwardly toward the central axis of the threaded opening so that said indentation has a first depth adjacent to said end surface and a second depth which is greater than said first depth at a location spaced apart from said end surface to provide for greater noncircularity of the noncircular thread convolutions adjacent to said crown end portion of the nut body than adjacent to the axially inner end of the non-circular thread convolutions, and a pair of side surfaces which intersect said end surface and said inner surface and diverge outwardly from said inner surface so that said indentation has a first width at the intersections of said side surfaces and said inner surfaces and a second width which is greater than said first width at the intersection of said indentation side surfaces and the associated one of said body side surfaces, each of the end surfaces of a series of indentations intersecting the associated one of said body side surfaces along a line extending parallel to said bottom end of said nut body, at least a central one of said indentations of a series of indentations having an inner surface which is longer than the inner surface of another one of said indentations of the series of indentations.

3,952,786
UNITARY WHEEL AND TIRE ASSEMBLY

William F. Kreling, St. Louis, Mo., and Vernon W. Sappington, Granite City, Ill., assignors to Plasco, Inc., St. Louis, Mo.

Filed July 1, 1974, Ser. No. 484,615
Int. Cl.² B60C 7/00; B60B 5/02
U.S. Cl. 152—323 3 Claims

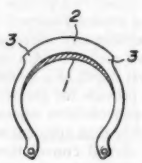


1. A wheel structure comprising a wheel portion and a tire portion, said wheel and tire portions being unitary and inseparable without wheel structure destruction, said wheel portion having a hub section, a web section disposed radially outwardly of said hub section, said web section having side walls and a cylindrical end wall, means connecting said hub section and said web section, said tire portion having a first surface of substantially corresponding extent as said wheel portion cylindrical surface and lateral components having inner surfaces of substantially coincident extent as said wheel web section side walls, said tire first surface and said lateral component inner surfaces being secured substantially throughout the entirety of their said surfaces with the cylindrical surface and side wall surfaces respectively of said wheel section whereby the same are intimately united throughout substantially the entirety of the respective interfaces, the material of construction of said wheel section and tire section being mutually adhesively compatible without the intervention of glutinous substances.

3,952,787
PUNCTURE-SEALING RUBBER COMPOSITION

Yosuke Okado; Hiroshi Fujikawa, both of Kodaira, and Takashi Takusagawa, Ohme, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Continuation of Ser. No. 388,666, Aug. 15, 1973, abandoned.
This application Aug. 12, 1974, Ser. No. 496,688
Claims priority, application Japan, Aug. 21, 1972, 47-82796
Int. Cl.² B60C 21/08
U.S. Cl. 152—347 4 Claims



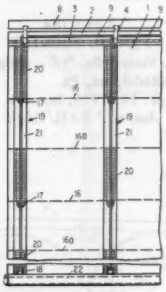
1. A tubeless tire carrying on the inner surface thereof a puncture-sealing rubber composition comprising

1. 100 parts by weight of a rubber containing at least 30% by weight of a polymer selected from the group consisting of ethylene-propylene copolymer and ethylene-propylene-diene terpolymer, the remainder being at least one rubber selected from the group consisting of natural rubber, polybutadiene rubber, styrene-butadiene rubber, chloroprene rubber, acrylonitrilebutadiene rubber and isobutylene-isoprene rubber,
2. from 50 to 500 parts by weight of polybutene having a number average molecular weight of from 1,000 to 5,000, and
3. from 5 to 700 parts by weight of an inorganic filler having an average particle diameter of less than 500 mm.

3,952,788
PLEATED PULL-UP CURTAIN

Alfred Schöler, Wuppertal, Germany, assignor to Vorwerk & Sohn, Textil- und Gummiwerke, Wuppertal-Barmen, Germany

Filed Apr. 2, 1975, Ser. No. 564,295
Claims priority, application Germany, Apr. 3, 1974, 7411620[U]
Int. Cl.² A47H 13/14
U.S. Cl. 160—84 R 6 Claims



1. A pleated pull-up curtain having horizontal pleats when in a pulled-up position, said pleats defining pleat fold lines, said curtain having a width, an upper part, a back side, a bottom portion, and a longitudinal direction extending from the upper part to the bottom portion, comprising: a supporting tape attached to said upper part of said curtain on said back side; hangers being attached to said supporting tape, serving as carrying and cord-guiding elements, and being guided in curtain rails; tapes fastened in a spaced apart fashion having a longitudinal direction and running in said longitudinal direction of said curtain, said tapes being provided with intermittent, alternatingly reinforced and unreinforced zones having a length and running in said longitudinal direction of said tape, said length of said zones being determined by said pleat fold lines; cord-guiding loops worked into said tapes at the level of each second pleat fold line; and pull-cords being fastened to said bottom portion of said curtain and guided in vertical and horizontal pull directions so that under simultaneous activation of all pull-cords, said curtain is evenly pulled upwards and thereby placed into said horizontal pleats over the width of said curtain.

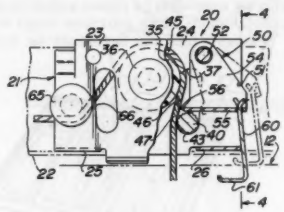
3,952,789
TOP POSITION LOCK FOR VENETIAN BLINDS

Anthony F. Marotto, Philadelphia, Pa., assignor to Marathon Manufacturing Company, Philadelphia, Pa.

Filed June 26, 1975, Ser. No. 590,595
Int. Cl.² E06B 9/30, 9/324
U.S. Cl. 160—168 R 7 Claims

1. A top position lock for a venetian blind including a head and a depending slat assembly, said top position lock comprising: a mounting structure in the head, a cord guide carried by the mounting structure, a jam member shiftably carried by the mounting structure for movement between a lower free position spaced below said guide and along a path obliquely upwardly toward said guide to an upper locking position proximate to said guide, a pull cord connected to said slat assembly for raising and lowering the latter upon respective downward

and upward cord movement, said pull cord being trained over said guide and depending gravitationally between said guide and jam member in engagement with the latter, downward cord movement in engagement with said jam member urging the latter downwardly to its free position and upward cord movement in engagement with said jam member urging the jam member upward to jam said cord against said guide, detent means shiftably carried by said head extending across



said jam member path in upward limiting engagement with said jam member to maintain the latter in its free position, and detent shifting means operative to shift said detent means out of said path to release said jam member for upward movement to jam said cord against said guide, said detent shifting means depending into the path of said slat assembly at its top position for release of said jam member to its upper position only when said slat assembly is fully raised.

3,952,790

ARRANGEMENT FOR HATCH COVERS

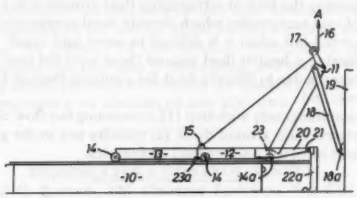
George Leitch, Newcastle-upon-Tyne, England, assignor to MacGregor International, S. A., Basel, Switzerland

Filed Dec. 9, 1974, Ser. No. 531,198

Claims priority, application United Kingdom, Dec. 7, 1973, 56909/73

Int. Cl.² E05F *11/06*

U.S. Cl. 160—193 **12 Claims**



1. A cover arrangement for a container comprising first and second cover elements hinged together and movable together to open and close the container, pulling means attached to said first cover element and direction changing means, through which the pulling means passes on said second cover element, to enable opening of the container to be carried out by applying an upward pull on said pulling means after it has passed through said direction changing means, a tripping lever on said first cover element extending in the direction of said second cover element, and guide ramp means cooperating with said tripping lever to guide said tripping lever in a downward direction, and to pivot said first cover element, with the assistance of said pulling means, into a substantially vertical position on opening of the cover arrangement.

3,952,791

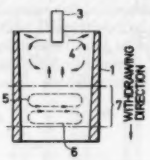
METHOD OF CONTINUOUS CASTING USING LINEAR MAGNETIC FIELD FOR CORE AGITATION

Yasuo Ito, and Yoshitake Suzuki, both of Kisarazu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 8, 1974, Ser. No. 431,605

Int. Cl.² B22D *11/12, 27/02*

U.S. Cl. 164—49 **11 Claims**



1. In a continuous casting method wherein molten metal is poured into a mold and a casting having a cross-section of substantially rectangular shape is withdrawn from the mold and supported to maintain the desired cross-sectional shape as it is slowly cooled from the outside thereof, the improvement which comprises applying to the molten metal in the crater of said casting, at a position which is between a location right beneath said mold to a location at which the casting has first completely solidified and which is along the side of said casting, a magnetic field traveling linearly in a direction perpendicular to the direction of withdrawing of the casting so as to agitate the molten metal in the crater, and giving to the magnetic field in intensity and traveling speed and direction for inducing substantially all of the molten metal at the position of application of the magnetic field to flow in an agitated stream in a plane perpendicular to the direction of withdrawing of the casting at the position of application of the magnetic field at a velocity such that the downwardly and rearwardly and upwardly and rearwardly diverging stream portions produced by the stream of molten metal striking the solidified shell are substantially immediately drawn back into the stream of the molten metal, said flow in the crater being confined within a narrow region in the direction of withdrawing the casting, whereby the secondary dendrite is broken up and the molten metal outside the region is prevented from coming thereinto for keeping the temperature distribution of the molten metal in said region substantially uniform thereby preventing production of white band and producing a grain structure in the cross-section of the casting which is nearly all equiaxed grain in the center portion, having dendrite on the periphery, and with substantially no secondary dendrite zone or segregation zone.

3,952,792

METHOD AND APPARATUS FOR CASTING A PLURALITY OF INGOTS

Raymond J. Roberts, Willingboro, N.J., assignor to Consarc Corporation, Rancocas, N.J.

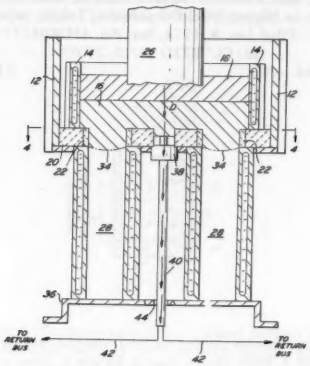
Filed July 25, 1974, Ser. No. 491,981

Int. Cl.² B22D *11/10, 27/02*

U.S. Cl. 164—52 **22 Claims**

1. A method of casting a plurality of ingots in a furnace comprising a main mold section in direct, open communication with a plurality of ingot mold sections having a total cross-sectional area less than the main mold section cross-sectional area, an electrode, and a conductor disposed outside the ingot mold sections, comprising the steps of forming a pool of molten metal in the main mold section, maintaining the molten metal pool in a molten state by directing an electrical current through the electrode and conductor, casting the plurality of ingots from the pool of molten metal by flowing the molten metal from the pool into the ingot mold sections

while preventing the molten metal from freezing at the interface between the main mold section and the ingot mold sections, and preventing the current from entering the molten metal in the ingot mold sections.



3,952,793

MOULDING FLASK FOR VACUUM SEALED MOULDING PROCESS

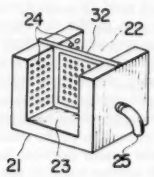
Itsuo Hijikata, Nagoya, and Hideto Terada, Toyokawa, both of Japan, assignors to Sintokogio, Ltd., Nagoya, Japan

Division of Ser. No. 329,082, Feb. 2, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,368

Claims priority, application Japan, Feb. 4, 1972, 47-15117[U]; Mar. 14, 1972, 47-31295[U]

Int. Cl.² B22C *15/22*

U.S. Cl. 164—160 **3 Claims**



1. A molding flask for use in a vacuum sealed molding process comprising a frame having two openings disposed opposite to each other and closable by pattern plates covered by a shield membrane of synthetic resin which forms a mold surface; a pair of spaced impervious resilient membranes disposed between said two openings; a pair of spaced supporting means disposed between said pair of spaced membranes whereby each of the supporting means supports respectively each of the spaced membranes at the outside thereof, said spaced membranes and said supporting means dividing the interior of the flask into two parts; at least one opening disposed at each of said parts for supplying charging material into each of said parts; means for transmitting atmospheric pressure into the space between the supporting means whereby the outside of each spaced membrane is subjected to the atmospheric pressure; and at least one opening disposed at each of said parts for communicating with a vacuum source, said source being protected against ingressing of the charged material, and whereby said charged material in each of said two parts is subjected to reduced pressure.

3,952,794

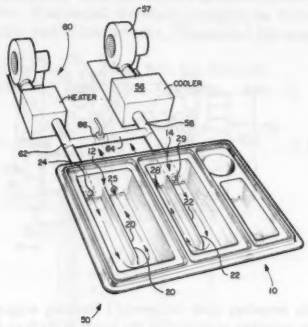
FOOD SERVICE TRAY

Louis Spanoudis, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 19, 1974, Ser. No. 480,946

Int. Cl.² F28D *21/00*

U.S. Cl. 165—2 **2 Claims**



2. In a method for the preparation of an individual meal wherein the components of said meal are placed in individual thermally conductive receptacles, the improvement in said method which comprises the steps of:

a. placing said individual thermally conductive reçeptacles carrying the components of said meal into compartments formed in a thermally insulating base member;

b. thermally isolating said individual receptacles from the outside atmosphere;

c. thermally isolating those individual receptacles which contain meal componenis to be served hot from those individual receptacles which contain meal components to be served cold;

d. flowing a refrigerated fluid within said base member around said receptacles containing said meal components to thereby maintain at least part of said meal in a chilled condition;

e. ceasing the flow of refrigerated fluid around selected ones of said receptacles which contain meal components to be served hot when it is desired to serve said meal;

f. flowing a heated fluid around those selected ones of said receptacles to thereby heat the contents thereof for serving; and

g. simultaneously with step (f), continuing the flow of refrigerated fluid around those receptacles not in the group of said selected ones of said receptacles.

3,952,795

AIR CONDITIONING SYSTEM

William E. Clark, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 29, 1974, Ser. No. 527,991

Int. Cl.² F25B *29/00*

U.S. Cl. 165—30 **4 Claims**

1. An air conditioning system for conditioning air in a plurality of enclosed areas in a building, each of the enclosed areas having a peripheral portion requiring conditioned air having a variable temperature, and an interior portion requiring conditioned air at a constant temperature, said system comprising:

terminal means disposed in each of said enclosed areas for the supply of conditioned air thereinto;

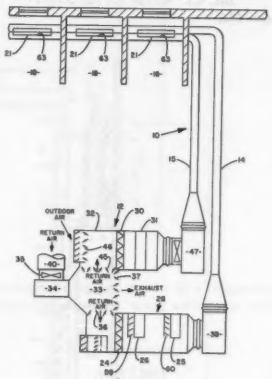
first air conditioning apparatus to provide conditioned air at a temperature level which may be varied;

means to supply said varying temperature conditioned air to a first portion of said terminal means;

second air conditioning apparatus to provide conditioned air at a relatively constant temperature level;

means to supply said relatively constant temperature air to a second portion of said terminal means;

said terminal means including first control means to regulate the quantity of said constant temperature air discharged into said area in accordance with the temperature in said interior portion of said area, said first control means including means to generate a variable magnitude control signal indicative of the quantity of constant temperature air discharged into said area; and



means to receive said signal including second air quantity regulating means operable, when the temperature of said varying temperature conditioned air is at a relatively warm level, to vary the quantity of said warm temperature air discharged from said first portion of said terminal means; as the magnitude of the control signal varies to indicate that the quantity of said constant temperature air discharged into said area is increasing, said second regulating means operates to reduce the quantity of said warm temperature air discharged into said area, and as the magnitude of the control signal further varies to indicate that the quantity of said constant temperature air discharged into said area is decreasing, said second regulating means operates to increase the quantity of said warm temperature air discharged into said area.

3,952,796

TEMPERATURE CONTROL SYSTEM

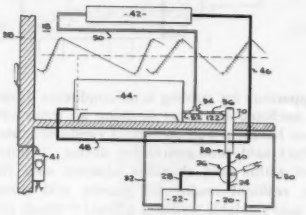
Richard C. Larson, 220 Crescent Parkway, Sea Girt, N.J. 08750

Filed Apr. 7, 1975, Ser. No. 565,613

Int. Cl.² F25B *29/00*

U.S. Cl. 165—40 **41 Claims**

1. An automatic cooling and heating system for providing temperature control for an enclosed control area, said system comprising a source of heated work fluid, a source of chilled work fluid, a heating heat exchanger in said control area, a cooling heat exchanger in said control area, said heating heat exchanger and said cooling heat exchanger both including a work fluid inlet and a work fluid exhaust, a temperature responsive control valve including a hollow valve housing, a first cylindrical valve sleeve mounted for axial rotation in said valve housing and having first and second open-ended internal sleeve chambers on each end separated by a transverse internal wall, said first cylindrical valve sleeve separating the interior of said hollow valve into first and second flow control chambers, a nested cylindrical valve sleeve matingly received within said second internal sleeve chamber of said first valve sleeve for axial rotation therein with respect to said first valve sleeve and said housing, a main supply inlet port in said valve housing communicating with said first flow chamber, selectively operable flow control means including conduit means and solenoid valve means alternatively providing communication between said main supply fluid inlet port and said source of hot work fluid or said source of chilled work fluid, a hot supply outlet port in said valve housing communicating with said first flow control chamber and connected to a supply pipe extending to the work fluid supply inlet of said heating heat exchanger, a cold supply outlet port in said valve housing communicating with said first flow control chamber and connected to a cold fluid supply pipe extending to the work fluid



inlet of said cooling heat exchanger, a spent fluid return in said valve housing communicating with said second flow control chamber and connected to conduit means connected to the work fluid exhaust of both said cooling heat exchanger and heating heat exchanger, a hot feed return port in said housing communicating with said second flow chamber and connected by conduit means to a feed inlet on said source of hot work fluid, a main supply sleeve port in said first internal chamber of said first cylindrical valve sleeve, said main supply sleeve port being alternatively alignable with said hot supply outlet port or said cold supply outlet port by rotation of said first cylindrical valve sleeve in said valve housing, a chiller fed return port on said housing communicating with said second chamber and connected by conduit means to an infeed inlet on said source of chilled work fluid, a spent fluid return sleeve port in said second internal chamber of said cylindrical valve sleeve, a first control means responsive to the temperature of work fluid in said first flow control chamber for positioning said first cylindrical valve sleeve in a heat mode position to align said main supply sleeve port with said hot supply outlet port and to simultaneously align said spent fluid return sleeve port with said hot feed return port in said housing when the temperature of fluid in said first flow chamber exceeds a first predetermined value and for positioning said first valve sleeve in a cooling mode position in which said main supply sleeve port is in alignment with said cold supply port in said housing and said spent fluid return sleeve port is in alignment with said chiller feed return port when the temperature in said first flow chamber is less than a predetermined second temperature, a flow modulating sleeve port in said nested cylindrical valve sleeve rotationally positionable in varying degrees of alignment with said spent fluid return sleeve port, a second control means connected to said nested cylindrical valve sleeve responsive to the temperature of fluid in said second flow chamber for positioning said flow modulating sleeve port with respect to said spent fluid return sleeve port for adjusting the degree of alignment between said flow modulating sleeve port and said spent fluid return sleeve port in accordance with the temperature in said second chamber for controlling flow through the system to maintain a desired temperature in said control area.

3,952,797

SEMI CONDUCTOR COOLING SYSTEM

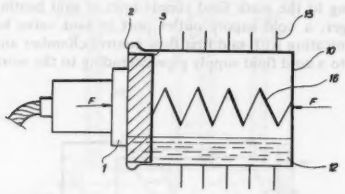
Bohuslav Voboril; Pavel Reichel, and Pavel Kafunek, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed Dec. 21, 1973, Ser. No. 427,225

Claims priority, application Czechoslovakia, Dec. 28, 1972, 9004/72

Int. Cl.² F28D *15/00*

U.S. Cl. 165—80 14 Claims



1. Apparatus for cooling semi-conductor devices comprising an enclosed container forming an inner chamber, said container having a wall portion of yieldable material adapted to contact said semi-conductor device, a porous member disposed within said chamber adjacent said yieldable wall portion, resilient means for biasing said porous member against said yieldable wall and a liquid medium partially filling the remainder of said chamber and immersing at least a portion of said porous member, whereby the latent heat of said device is dissipated in a closed evaporator-condenser cycle.

3,952,798

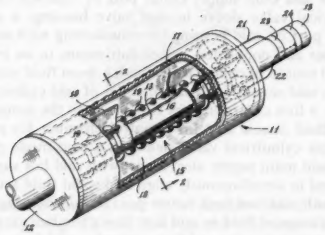
INTERNALLY HEATED HEAT PIPE ROLLER

Dean L. Jacobson, Monrovia, and Randolph W. Hamerdinger, Glendora, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 31, 1970, Ser. No. 68,299

Int. Cl.² F28D *15/00*

U.S. Cl. 165—105 4 Claims



1. An internally heated heat pipe for heating the outer surface of the heat pipe substantially uniformly over the length thereof comprising:

a. a container comprising a cylindrical side wall and two end walls for providing a closed space, said side wall having inner and outer surfaces,

b. an elongated member positioned within said container and extending substantially parallel to the axis of said container,

c. a wick structure comprising first, second and third portions, said first wick portion overlying said elongated member, said second wick portion overlying the inner surface of said side wall, said third wick portion extending in a radial direction from said first wick portion to said second wick portion, said first, second and third wick portions being saturated with a heat transer fluid, said heat transfer fluid being vaporized when a predetermined amount of heat is applied thereto, and

d. means for applying heat to said heat transfer fluid in an amount sufficient to vaporize said heat transfer fluid, said heat applying means overlying said first wick portion, the heat in said vapor being transferred substantially uniformly to said outer side wall surface along the length thereof.

3,952,799

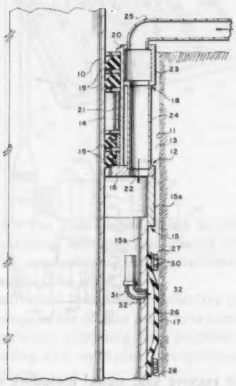
APPARATUS FOR BOREHOLE DRILLING

Harry Elwood Simpson, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 24, 1974, Ser. No. 517,661

Int. Cl.² E21B *33/12, 33/127*

U.S. Cl. 166—116 3 Claims



1. An independent seal assembly for placement in an annulus between a rotatable drillpipe and a borehole and arranged for sealing engagement therewith, said seal assembly comprising:

generally cylindrical tubular housing means adapted for telescopic placement over a drillpipe into a well bore annulus;

inner resilient seal means inside said housing means arranged for sealingly and circumferentially contacting the drillpipe;

outer resilient seal means on said housing means adapted to circumferentially sealingly engage the borehole wall;

wherein said inner resilient seal means comprises one or more resilient circular rings attached to said housing means and arranged to contact the drillpipe in flexed sealing relationship; and,

latch means attached to said housing means and adapted to latch to the drillpipe upon upward movement thereof, said latch means comprising one or more hinged angular cogs arranged to be selectively rotated into engagement with discontinuities on the drillpipe outer surface.

3,952,800

SONIC TECHNIQUE FOR AUGMENTING THE FLOW OF OIL FROM OIL BEARING FORMATIONS

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Mar. 14, 1974, Ser. No. 450,989

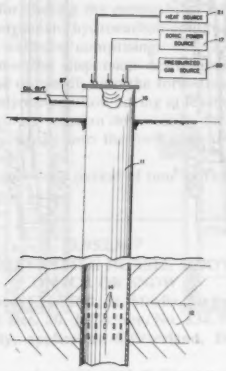
Int. Cl.² E21B *43/24, 43/25*

U.S. Cl. 166—249 9 Claims

1. A method for augmenting the flow of fluid through an oil well casing installed in the ground, said casing having a gas column formed therein which extends from the head of the well down to the region of the source of said fluid, comprising the steps of:

generating high-level sonic energy, and

coupling said sonic energy to said gas column at the head of said well, whereby the sonic energy is transmitted down said column and into said formation to provide the high level sonic energy therein,



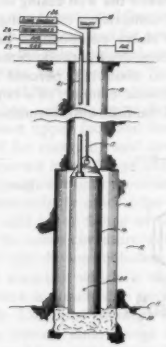
said sonic energy being generated at a frequency such as to set up resonant standing wave vibration within said gas column.

3,952,801

METHOD FOR IGNITING OIL SHALE RETORT

Robert S. Burton, III, Grand Junction, Colo., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Filed July 26, 1974, Ser. No. 492,593
Int. Cl.² E21B *43/24*
U.S. Cl. 166—256 7 Claims



1. A method for igniting a rubble pile of expanded oil shale in an in situ oil shale retort comprising the steps of:

forming an in situ oil shale retort containing a rubble pile of fragmented oil shale;

boring a hole to the top of the rubble pile;

underreaming a region at the bottom of the hole after forming the rubble pile for forming a plenum at the bottom of the hole adjacent the area of the rubble pile to be ignited, the plenum having a larger cross section than the hole;

lowering a burner through the hole at least part way into the plenum;

burning a mixture of combustible material and oxidizing gas in the burner for directing a flame towards the rubble pile; and

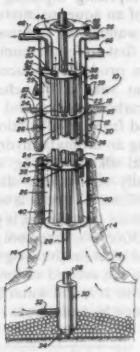
forcing a quantity of oxidizing gas through the hole into the plenum around the burner for cooling the burner, carrying heat downwardly into the shale, and providing oxygen for combustion of carbonaceous material in the oil shale.

3,952,802

METHOD AND APPARATUS FOR IN SITU GASIFICATION OF COAL AND THE COMMERCIAL PRODUCTS DERIVED THEREFROM

Ruel C. Terry, Denver, Colo., assignor to In Situ Technology, Inc., Denver, Colo.

Filed Dec. 11, 1974, Ser. No. 531,453
Int. Cl.² E21B *43/24*
U.S. Cl. 166—262 25 Claims



1. Apparatus for in situ gasification of a subsurface coal formation which is in communication with a surface location by an open passage comprising in combination:

a casing in said passage, said casing having divider means defning vertically aligned compartments in said casing, each of said divider means, with the exception of the uppermost and lowermost ones of said divider means, having openings therethrough establishing fluid communication between adjacent compartments defined between said uppermost and lowermost divider means for the passage of fluid material between adjacent compartments,

injection conduit means extending from said surface location to the coal formation,

gas removal conduit means extending from the coal formation to the surface location, said gas removal conduit means passing through said compartments in the casing,

fluid inlet means for introducing a heat receptive fluid into the uppermost one of said compartments whereby said heat receptive fluid can flow downwardly through successive compartments to strip sensible heat from the gases passing through said gas removal conduit means, and

fluid removal means for transferring the heat receptive fluid from the lower end of the casing to the surface location where the heat in the fluid can be removed for useful purposes.

7. A method of in situ gasification of a subsurface coal formation comprising the steps of:

establishing a passage between a surface location and the coal formation,

setting a casing in the passage,
injecting a plurality of hot particles in a non-flammable environment into said casing, said particles having a temperature in excess of the ignition temperature of coal, and
allowing at least some of the particles to come into contact with the coal to ignite the coal causing it to burn and give off useful gases.

3,952,803

OIL RECOVERY METHOD USING OVERBASED WATERFLOOD ADDITIVE CONTAINING SULFONATES DERIVED FROM ALKYLATION REACTION PRODUCTS

Oliver C. Kerfoot; Charles R. Clark, both of Ponca City, Okla., and Carl D. Kennedy, San Diego, Calif., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 388,689, Aug. 15, 1973, abandoned.
This application Jan. 8, 1975, Ser. No. 539,218
Int. Cl.² E21B *43/22*
U.S. Cl. 166—270 4 Claims

1. A process for recovering hydrocarbons from a petroliferous formation comprising injecting into the formation an effective amount of an aqueous mixture containing about 0.5 to 25 wt. % of a waterflood additive comprising (a) a base component; (b) a first sulfonate component derived from an alkylation reaction product produced by alkylating an aromatic hydrocarbon with a branched-chain alkene having about 10 to 35 carbon atoms; and (c) a second sulfonate component derived from an alkylation reaction product produced by alkylating an aromatic hydrocarbon with a partially chlorinated normal alkane having about 10 to 18 carbon atoms, said partially chlorinated alkane being prepared by chlorinating said alkane to about 2 to 15 wt. % chlorine content; wherein the base component is present in a weight ratio range of 3/100 to 300/100, base component to total sulfonate of (b) and (c), and wherein the weight ratio of the first sulfonate component to the second sulfonate component is in the range of about 9/1 to 1/9; and waterflooding the formation to recover the displaced hydrocarbons.

3,952,804

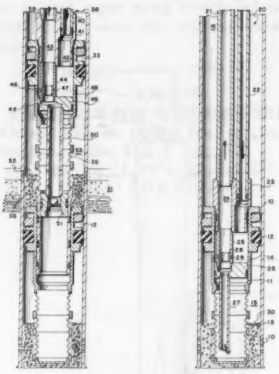
SAND CONTROL FOR TREATING WELLS WITH ULTRA HIGH-PRESSURE ZONES

Kenneth E. Smyrl, Marrero, La., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 2, 1975, Ser. No. 537,878
Int. Cl.² E21B *43/04*
U.S. Cl. 166—278 11 Claims

1. Apparatus for treating an underground formation penetrated by a well bore, said apparatus comprising:
an elongated ported tubular mandrel;
a well packer mounted on said mandrel;
a sandscreen mounted on said mandrel;
a first conduit means adapted for passing through said packer and mandrel and into said sandscreen;
valve means in said first conduit means arranged to communicate with port means in said mandrel;
seal means below said valve means and said port means and adapted to seal between said first conduit means and said mandrel; and,
a second conduit means besid. said first conduit means communicating with said mandrel above said seal means.

7. A method of placing an aggregate pack in a high-pressure formation in a well bore, comprising:
setting in the producing interval of the well bore a packer having a ported mandrel and sandscreen therebelow;
flowing through a first conduit a suspension of aggregate in a carrier fluid down the well bore and out the ported mandrel into the annulus below the packer;
returning the carrier fluid through the sandscreen and up a second flow conduit in the well bore;
diverting the flow path from the first conduit through said packer and directly into the second conduit; and,



flowing a well killing fluid through said first conduit and up said second conduit.

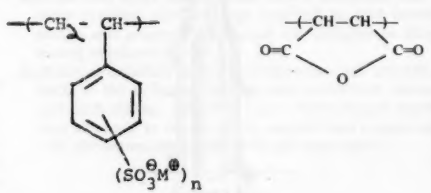
3,952,805

WELL CEMENTING METHOD USING A COMPOSITION HAVING IMPROVED FLOW PROPERTIES, CONTAINING SULFONATED COPOLYMERS OF STYRENE-MALEIC ANHYDRIDE

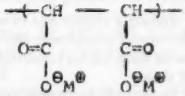
Leonard J. Persinski, Pittsburgh; Fred David Martin, McMurray, and Sally Lee Adams, Pittsburgh, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 27, 1975, Ser. No. 553,391
Int. Cl.² E21B *33/14, 33/138*
U.S. Cl. 166—293 8 Claims

1. In the method of cementing a well comprising the step of pumping an aqueous hydraulic cement slurry into place in the annular space between the well casing and the well bore-hole, the improvement comprising employing therein an aqueous hydraulic cement slurry composition having improved flow properties comprising dry hydraulic cement in admixture with from about 0.01 to about 5.0 percent by weight, based on weight of dry hydraulic cement, of a copolymer of randomly repeating units of the following formulas:



and



where M is hydrogen, ammonium or alkali metal ion, and *n* is an integer of 1 to 3; and
sufficient water to make a pumpable slurry which is capable of setting to form a monolithic solid.

3,952,806

METHOD FOR ALTERING PERMEABILITY OF A HYDROCARBON-CONTAINING FORMATION

Joseph C. Trantham, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 16, 1975, Ser. No. 587,181
Int. Cl.² E21B 33/138
U.S. Cl. 166—294 12 Claims

1. A method for altering the permeability of at least a portion of a subterranean hydrocarbon-containing formation penetrated by a wellbore, comprising:

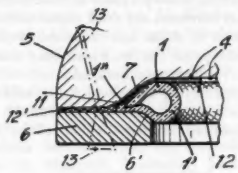
1. passing a micellar dispersion downwardly through the wellbore and outwardly into the formation;
2. passing a polymer solution having at least one contacting aluminum citrate solution downwardly through the wellbore and outwardly into the formation to a preselected location; and
3. closing the well for a period of time sufficient for gelling the polymer in situ.

3,952,807

DEVICE FOR PREVENTING HORSES' HOOVES SLIDING ON ICE OR SNOW

Guiseppe Cattaneo, CH-7500, St. Moritz, Switzerland

Filed Dec. 20, 1974, Ser. No. 534,929
Claims priority, application Switzerland, Dec. 21, 1973, 17984/73
Int. Cl.² A01L 7/02
U.S. Cl. 168—28 10 Claims



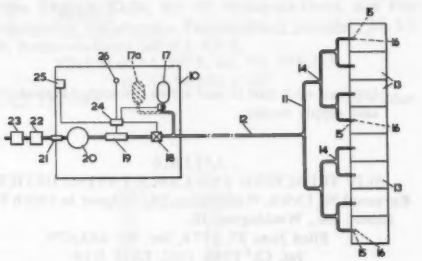
1. In combination with a horseshoe which is adapted to be affixed to the sole of a horse's hoof, a resilient U-shaped device for preventing the ingress and freezing of snow and ice between the horseshoe and hoof and for preventing the formation of lumps of ice on the sole, said U-shaped device comprising a comparatively thin, flat supporting flap oriented parallel to the upper face of said horseshoe and having a shape similar to that of said horseshoe, said flap being disposed in the region between said horseshoe upper face and the facing portion of the sole of said hoof for clamping said device in place, said horseshoe having a curved inner flange adapted to be extending below said sole in a direction transverse to the upper face of said horseshoe, the radially inner edge of said flap being located adjacent to said inner flange of said horseshoe and having substantially the same curvature as the inner flange of said horseshoe, and said device including an elastically deformable, U-shaped member which is significantly thicker than said flap and which is attached to said inner edge of said flap, said deformable U-shaped member being substantially coextensive with the curved inner flange of said horseshoe, said elastically deformable member including a first surface which extends below said flap in at least partially overlying relation to the inner flange of said horseshoe to an extent no greater than the lower face of said horseshoe and in resilient engagement with said curved inner flange of said horse-shoe, and said elastically deformable member including a second surface which extends radially inward of said flap to a limited extent and which resiliently engages said sole along a confined U-shaped arcuate region located radially inward of the inner flange of said horseshoe, the opposite ends of said U-shaped member being spaced from one another at positions closely adjacent the opposing ends of said horseshoe to leave exposed the portion of said sole radially inward of said confined arcuate region.

3,952,808

FIRE PROTECTION SYSTEMS

Edward Gregory Richardson, Bathford, England, assignor to National Research Development Corporation, London, England

Filed Jan. 21, 1975, Ser. No. 542,676
Claims priority, application United Kingdom, Jan. 23, 1974, 3193/74; Mar. 15, 1974, 11608/74
Int. Cl.² A62C 37/04
U.S. Cl. 169—61 10 Claims



1. A protection system for use in the detection of smoke from one or more of a plurality of locations and the subsequent release of an extinguishant into these locations including a main tube, a plurality of sensing tubes in a pre-arranged distribution network in fluid connection with one end of said main tube and with the open ends of said tubes of said network extending into said locations to be protected, each of said sensing tubes containing a restrictor nozzle in its open end to restrict and control flow through said network, a control unit in fluid connection with the other end of said main tube and including a pump arranged to draw air through said tube network and said main tube, a smoke detector arranged to sample said air and provide warning of the presence of smoke in said sampled air, a source of extinguishant, and valve means which upon activation from said smoke detector will operate to seal off the smoke detection capability and initiate the release of extinguishant through the same said main tube and distribution network as that utilized for the detection operation of the system.

3,952,809

SERIES TO PARALLEL TRANSFER CIRCUIT FOR INITIATOR STRING

William B. Osborne, Marlboro, Mass., assignor to Walter Kidde & Co., Inc., Clifton, N.J.

Filed Mar. 14, 1975, Ser. No. 558,471
Int. Cl.² A62C 37/04
U.S. Cl. 169—61 10 Claims

1. An electrical protection system comprising:

a plurality of suppressor units activatable to suppress an abnormal condition;

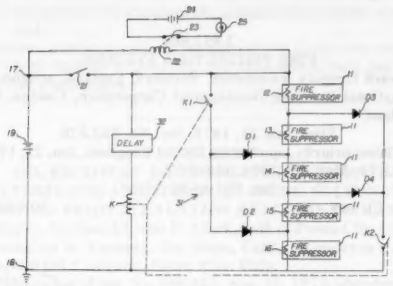
a plurality of electrical current responsive activators, one associated with each of said suppressor units and adapted to induce activation thereof;

electrical current supply means;

control circuit means connecting said activators in series and comprising actuator means for initiating activating current flow from said supply means to said series connected activators; and

auxiliary circuit means comprising switch means for connecting said activators in parallel in response to initiation of activating current flow by said actuator means, said

switch means comprising a plurality of electronic switches, one connected between each of the junctions



between each pair of said series connected activators and said supply means.

3,952,810

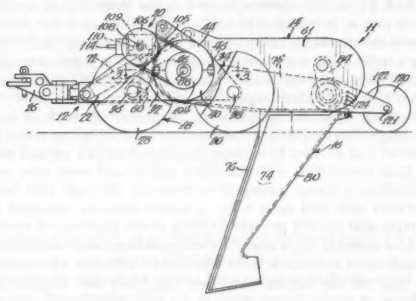
SLIT TRENCHING AND CABLE LAYING DEVICE

Raymond M. Ulrich, Washington, Ill., assignor to Ulrich Foundation, Inc., Washington, Ill.

Filed June 27, 1974, Ser. No. 483,679

Int. Cl.² F16L *1/02;* **E02F** *5/18*

U.S. Cl. 172—40 **23 Claims**



1. In a slit trenching and cable laying device, in combination, frame means, support means for holding said frame means above the ground, said frame means carrying plow means for forming a trench and laying a cable or line therein, first means on said frame means for imparting an oscillating digging motion to said plow means in the plane of the trench, and second means on said frame means for imparting a motion to said plow means to reduce the surface contact between said plow means and the sides of the trench, whereby the power necessary to drive said device is reduced.

3,952,811

ROCK CRUSHER

Francois Carre, 89730 Mailly-la-Ville, France

Filed Sept. 13, 1973, Ser. No. 396,850

Claims priority, application France, Sept. 5, 1973, 73.32086

Int. Cl.² A01B *33/00*

U.S. Cl. 172—45 **8 Claims**

1. Rock crusher comprising

a frame adjustably supported upon a plurality of wheels,

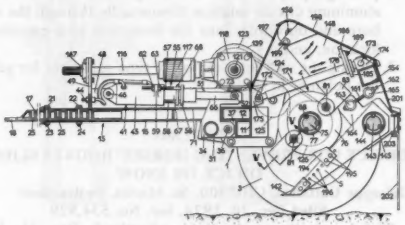
a drawbar for connecting said frame to a tractor,

a row of plowshares extending transversely of said frame, with the individual plowshares extending in a direction having a substantial vertical component,

a rotor rotatably mounted in said frame substantially parallel to said row of plowshares and on the same side of said plowshares as said drawbar,

a plurality of hammers each pivotally attached at one end thereof to a point on the circumferential periphery of said rotor between said plowshares so that said hammers may swing freely about said points and the other ends of said hammers are urged radially outward to points between the lower ends of said plowshares by centrifugal force when said rotor turns,

drive means for said rotor adapted to be connected to the power take-off of a tractor.



said rotor comprising a shaft which carries a series of circular discs separated by spacer rings, said discs being pierced near their peripheries by rods to at least one of which said hammers are pivotally connected between said discs, and said hammers are thick plates which are generally rectangular in shape and mounted for limited axial movement along the rod to which they are connected between two resilient members, and

said plowshares carrying stops which are adjustable along the plowshares and adapted to prevent the rocks from becoming squeezed between the discs of the rotor and the plowshares.

3,952,812

GARDEN TOOL

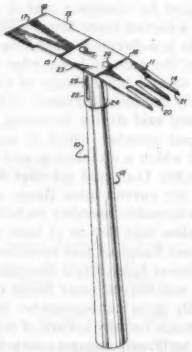
Joseph L. Lucan, 16 545 Armstead St., Granada Hills, Calif. 91344

Filed Aug. 28, 1972, Ser. No. 284,427

Disclosure was also published under Trial Voluntary Protest Program on Jan. 28, 1975.

Int. Cl. A01b *1/20*

U.S. Cl. 172—375 **6 Claims**



1. A gardener's hand tool, comprising:

a. a head member, said head member having a blade, intermediate and tine sections, said tine section including a plurality of tines, each of said tines being relieved on the under side of said tine so as to provide the space between said tines with a wedge-shaped cross-section;

b. a handle, said handle being provided with a tapered configuration;

c. a ferrule, said ferrule being provided with a tapered configuration and fitting over a portion of said handle and being firmly attached to said handle; and

d. a flange member attached to said ferrule, said flange member having one side attached to one end of said ferrule and the opposite side attached to the intermediate section of said head member so as thereby to attach said handle to said head member, said intermediate section and said flange member being disposed at an angle of substantially 90° to said handle, said blade section and said tine section being disposed on opposite sides of said intermediate section, said blade section and said tine section being disposed at a predetermined angle to said intermediate section.

3,952,813

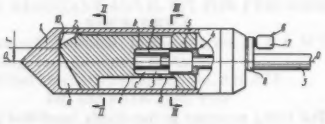
PERCUSSIVE DEVICE FOR DRIVING HOLES IN SOIL

Nikolai Prokhorovich Chepurnoi, 107, ulitsa Televizionnaya, 11, kv. 20; Alexandr Dmitrievich Kostylev, 91, ulitsa Derzhavina, 19, kv. 44; Konstantin Stepanovich Gurkov, ulitsa Derzhavina, 19, kv. 13; Konstantin Konstantinovich Tupitsyn, ulitsa Krylova, 3, kv. 37; Sergei Konstantinovich Tupitsyn, ulitsa Zorge, 123, kv. 31; Nikolai Grigorievich Nazarov, ulitsa Gogolya, 3, kv. 10; Vladimir Dmitrievich Plavskikh, ulitsa Kamenskaya, 84v, kv. 33; Khaim Berkovich Tkach, ulitsa Gogolya, 17, kv. 49; Evgeny Nikolaevich Cherednikov, ulitsa Lenina, 32, kv. 6, all of Novosibirsk; Alexandr Nisovich Galbinshtein, Leninsky prospekt, 89, kv. 214, Moscow; Mikhail Vladimirovich Borshtein, Pirogovskaya, 5, kv. 78, Odessa; Andron Trofimovich Karavaev, ulitsa Pervomaiskaya, 118, kv. 19, Novosibirsk; Valery Anatolievich Menzorov, ulitsa Sorevnovania, 40, Novosibirisk, and Alexei Mikhailovich Makarov, Vostochny poselok, 8a, kv. 16, Novosibirisk, all of U.S.S.R.

Filed Feb. 7, 1975, Ser. No. 548,137

Int. Cl.² E21B *1/00, 11/02*

U.S. Cl. 173—91 **12 Claims**



1. A percussive device for driving holes in the soil, comprising: a hollow cylindrical housing with a pointed front end; a hammer piston accommodated in said housing for reciprocation under the action of compressed air, said piston having a cavity in permanent communication with a source of compressed air used to reciprocate said hammer piston, said hammer piston being positively rotatable relative to said housing and forming together therewith a front working chamber; an air distribution mechanism including a tube mounted in said housing within the cavity of said hammer piston so as to form a rear working chamber together therewith, said piston having air passages therein positioned so that during the reciprocation of said hammer piston, said tube alternately communicates, via said passages, said front working chamber with said rear working chamber and ambient atmosphere; and means for controlling the direction in which the hole is driven in the soil, said means being consituted by a construction wherein said hammer piston has a center of gravity offset with respect to the longitudinal axis of said housing, said hammer piston having a contact point at which it strikes said housing located on a line substantially extending through the center of gravity of said hammer piston.

3,952,814

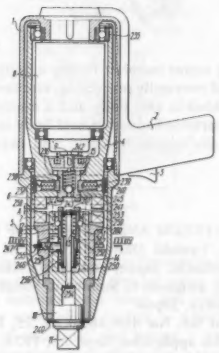
IMPACT WRENCH

Mikhail Lvovich Gelfand, Yaroslarskoe shosse, 129, kv. 44, Moscow; Yakov Isaakovich Tsipenjuk, ulitsa Kirova, 5, kv. 30, Moskovskaya oblast, Solntsevo; Petr Ivanovich Podlesnykh, ulitsa Raschupkina, 12, korpus 1, kv.29, Moscow; Georgy Afanasievich Antipov, ulitsa Krasny Mayak, 3, kv. 146, Moscow; Boris Grigorievich Goldshtein, ulitsa Molodogvardeiskaya, 24, korpus 1, kv. 26, Moscow; Nikolai Stanislavovich Lavnikov, ulitsa Kustanaiskaya, 117, kv. 10, Rostov-na-Donu; Leonid Nikolaevich Teres, ulitsa 2 Koltsevaya, 61/21, Rostov-na-Donu; Ivan Ivanovich Urazhdin, ulitsa Engelsa, 52/56, kv. 18, Rostov-na-Donu, and Petr Stepanovich Yakubovsky, Podshipnikovy pereulok, 12, kv. 36, Rostov-na-Donu, all of U.S.S.R.

Filed Mar. 14, 1975, Ser. No. 558,715

Int. Cl.² B25D *15/00*

U.S. Cl. 173—93 **24 Claims**



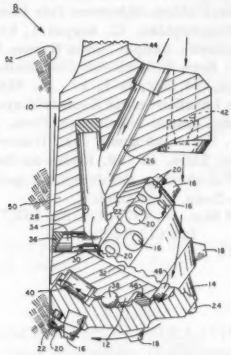
1. An impact wrench comprising: a housing; a hammer mounted in said housing and having impact jaws; an anvil mounted in said housing and having impact jaws; said hammer and anvil being mounted coaxially in a space relationship and axially movable with respect to each other; a drive having an output shaft connected to said hammer for transmitting rotary motion thereto; a device for said relative axial displacement of said hammer and anvil for engagement of their jaws and for transmitting a blow to the anvil; a spindle journalled in said housing connected to said anvil for rotation together therewith, said spindle having means for receiving a socket wrench; a device for preliminary interaction of said hammer and anvil prior to the engagement of their impact jaws, said device having two parts axially movable relative to each other; the first part of said device for said preliminary interaction of said hammer and anvil being disposed in said hammer; the second part of said device for said preliminary interaction of said hammer and anvil being disposed in said anvil; members engaging each other upon relative displacement of said parts disposed on said parts and providing for said preliminary interaction of said hammer and anvil; said members of said first and second parts being at the same angle to said impact jaws of the hammer and anvil, respectively, whereby, upon said preliminary interaction of said hammer and anvil their impact jaws engage each other as they are mutually oriented; a device for disengaging the said impact jaws of the hammer and anvil.

3,952,815

LAND EROSION PROTECTION ON A ROCK CUTTER

Theodore Rivers Dysart, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 24, 1975, Ser. No. 561,576
Int. Cl.² E21C 13/01; E21B 9/35
U.S. Cl. 175—374 6 Claims



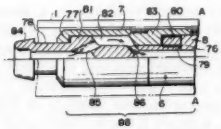
3. A rolling cutter member having a body with at least one annular row of outwardly projecting, circumferentially-spaced inserts embedded in said body and a multiplicity of substantially flush inserts embedded in said body in said annular row circumferentially-spaced between said outwardly projecting inserts.

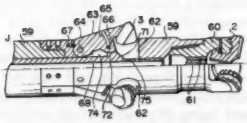
3,952,816

DRILLING SYSTEM AND METHOD OF PULLING IT UP

Sho Takano; Yasushi Okuyama, both of Tokyo; Ryokuya Suzuki, Kunitachi, Japan, and Ikuma Kinoshita, Chigasaki, all of Japan, assignors to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Division of Ser. No. 406,482, Oct. 15, 1973, Pat. No. 3,894,590. This application Sept. 23, 1974, Ser. No. 508,459
Int. Cl.² E21B 7/18, 3/12
U.S. Cl. 175—67 2 Claims





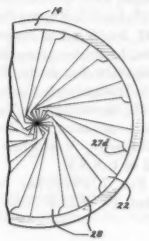
1. In a drilling system, comprising a hollow drill pipe located below ground surface and cutting means disposed within said drill pipe, said cutting means having an axial passageway therein through which water is fed at a first predetermined rate of pressure for operating a hydraulic motor which rotates said cutting means during a drilling operation; said cutting means having reaming bits resiliently urged outwardly thereof under said first pressure rate, a pressing piece on said cutting means resiliently urged into engagement with an inner surface of said drill pipe under said first pressure rate for maintaining said cutting means concentrically within said drill pipe, a method of pulling up said cutting means out of said drill pipe, comprising the steps of feeding water through a hollow wire connected to said cutting means and through said axial passageway at a second predetermined rate of pressure lower than said first pressure rate, bypassing the water at said second pressure rate away from said motor and to said reaming bits and said pressure piece for permitting same to move inwardly of said cutting means against the action of said lower second pressure rate, the water being fed out through the underground end of said cutting means so as to avoid any vacuum pressure produced during pulling up and to assist in the pulling up and winding up said wire by a winding means.

3,952,817

BASKET TYPE CORE RETAINER

John Forrest Anderson, Minneapolis, Minn., assignor to Longyear Company, Minneapolis, Minn.

Filed Mar. 8, 1974, Ser. No. 449,463
Int. Cl.² E21B 9/20
U.S. Cl. 175—240 16 Claims

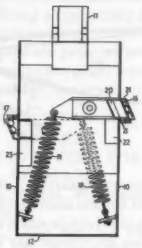


1. For being mounted in the axially inner end portion of a core tube or a soil sampler tube, a core retainer mountable in said tube for retaining core in the tube axially outwardly thereof, said core retainer having a central axis and comprising a mounting ring and spring finger means mounted by the mounting ring for movement between a closed position for retaining core in said tube and an open position extending further axially away from the mounting ring than in the closed position to permit passage of a core therethrough, said spring means including a plurality a elongated fingers having one end portions axially adjacent the mounting ring that are at least partially interleaved, and opposite end portions that are at least partially interleaved in the spring means closed position, said spring means including a first spring finger assembly and a second spring finger assembly, each of the first and second assemblies respectively including a first plurality and a second plurality of said fingers and a first and a second band portion, the band portion of the first assembly being located radially outwardly of the band portion of the second assembly, the first fingers being joined to the first band portion to extend axially outwardly thereof and the second fingers being joined to the second band portion to extend axially outwardly thereof.

3,952,818
GROOVING BUCKET

Terence George Jasper, Sydney, Australia, assignor to Frankipile Australia Pty Limited, Australia

Filed Nov. 7, 1974, Ser. No. 521,628
Claims priority, application Australia, Dec. 21, 1973, 6083/73; July 10, 1974, 71450/74
Int. Cl.² E21B 9/26
U.S. Cl. 175—277 15 Claims

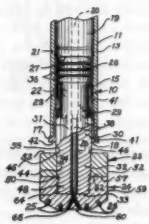


1. A grooving bucket for forming grooves or bells in the ground around a hole or socket that has been drilled into the ground to allow casting of a concrete pile, said grooving bucket comprising a cylindrical bucket portion adapted to be attached to a drilling machine, there being provided within the bucket portion at least one cutter which is movably mounted so as to be movable from a retracted position in which said cutter lies wholly within the circumference of the bucket portion, to a cutting position in which said cutter projects substantially radially from the circumference of the bucket, said cutter being held in the retracted position by means of a removable wedge and said cutter being movable from the retracted position to the cutting position by means of at least one tension spring attached to said cutter, and wherein said cutter is shaped to cause spoil to be led into the interiors of the bucket during the rotation of said bucket to cut a groove in the ground.

3,952,819
FATIGUE RESISTANT ANVIL BIT FOR PERCUSSION ROCK DRILL

Gerald L. Adcock, Lewiston, Idaho, assignor to A & W Deep-Well Drilling, Inc., Lewiston, Idaho

Filed Mar. 10, 1975, Ser. No. 556,673
Int. Cl.² E21B 1/06, 9/22
U.S. Cl. 175—293 9 Claims



1. A fatigue resistant anvil bit for a percussion rock drill, comprising:

an elongated anvil body having a rear impact end with an anvil head section of a prescribed diameter and having an integrally formed shank extending from the rear end to a threaded bit end in which the diameter of shank from the anvil head section to the threaded end does not exceed the prescribed diameter of the anvil head section;

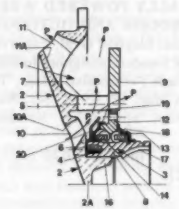
an enlarged removable bit head threadably mounted on the threaded bit end with a plurality of cutting elements mounted in a face surface thereof; said enlarged bit head having a rear surface extending laterally from the shank; and

an enlarged anvil ring shrunk fit on the shank adjacent the threaded bit end having a forward support surface complementary to and engaging the rear surface of the bit head to provide lateral support to the bit head without increasing the cross section of the anvil body adjacent the threaded bit end.

3,952,820
HUB DEVICE FOR A WHEEL OF A ROAD VEHICLE

Sture Lennart Asberg, Partille, Sweden, assignor to SKF Nova A.B., Goteborg, Sweden

Filed Dec. 3, 1973, Ser. No. 420,807
Claims priority, application Sweden, Dec. 8, 1972, 16001/72; Dec. 8, 1972, 16000/72
Int. Cl.² B60T 5/00
U.S. Cl. 180—1 R 19 Claims



1. A wheel and a bearing structure for a vehicle, comprising a roller bearing having an inner ring, an outer ring, two rows of rolling bodies between said inner and outer rings, and sealing means for said rolling bodies, a wheel disc affixed coaxially to one of said rings and having a smooth surface away from said one ring, said wheel disc extending conical outward with the outer edge of the disc being spaced laterally away from said one ring, a brake device affixed coaxially to the side of said wheel disc opposite said smooth surface, said disc having air cooling apertures with edges positioned to direct cooling air streams through said wheel disc and against said brake device.

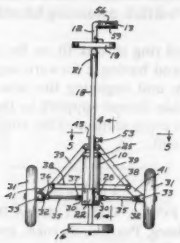
3,952,821
MOTOR DRIVEN GOLF BAG CART

Charles G. Craven, 35 Will Drive, Canton, Mass. 02021

Filed Jan. 22, 1975, Ser. No. 543,157
Int. Cl.² B62D 51/04
U.S. Cl. 180—19 R 9 Claims

1. A golf bag cart including a support, an upright attached to said support and including a handle, a bag holder attached to said support and said upright, a drive mounted on said support and including a battery powered electric motor, a pair of coaxial shaft portions at least one of which is part of said drive, a pair of wheels, each including a hub and a stub shaft extending therethrough, an intermediate shaft for each wheel and including universal joints, one connected to the appropriate shaft portion and one connected to the appropriate stub shaft, first and second links for each wheel and pivotally connected thereto with their pivot axes coaxial, the first links pivotally connected to the support, a slide on said upright, the second links pivotally connected to said slide, and means releasably locking said slide to said upright in a first position in which said wheels are spaced apart with said stub and shaft portions substantially coaxial, said locking means, when re-

leased, permitting said slide to be moved towards said handle into a second position in which said links are folded upwardly



close to the upright and substantially parallel and with said wheels spaced substantially closer together.

3,952,822

ELECTRICALLY POWERED WHEEL-CHAIR FOR INDOOR AND OUTDOOR USE

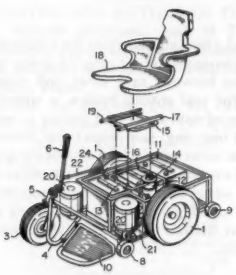
Per Udden, Timra; Siegfrid Graf, Fagervik, and Bert Engman, Soberge, all of Sweden, assignors to Stiftelsen Teknisk Hjalp at Handikappade Permobilstiftelsen, Timra, Sweden

Filed Mar. 18, 1974, Ser. No. 452,146

Claims priority, application Sweden, Mar. 19, 1973, 7303827

Int. Cl.² B62D 61/12

U.S. Cl. 180—21 **7 Claims**



1. An electrically powered wheel-chair for stable and maneuverable indoor and outdoor use, comprising in combination:

a pair of rear main wheels, which are rigidly connected with the frame of the chair, at least one of said main wheels being driven by an electric traction motor,

a front steering wheel, which is rotatably connected with the frame and located on one side of a longitudinal axis through the middle of the chair,

a support wheel with less diameter than the steering wheel, said support wheel being connected with the frame and located on the other side of said longitudinal axis relative to said steering wheel at such a level that it will not touch a horizontal and even support surface when the steering wheel is directed straight ahead, whereby the fore-most point of the steering wheel is located ahead of the fore-most point of the support wheel, a portion of the frame positioned between the main wheels being designed in the form of a case, adapted to contain batteries, the common center of gravity of which will be located on the same side of the longitudinal axis of the chair as the steering wheel.

3,952,823

VEHICLE GAS EXTRACTOR

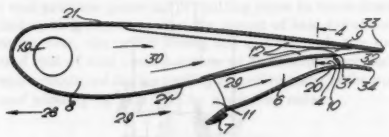
Mitja Victor Hinderks, 15a Adamson Road, Hampstead, London N.W.3, England

Continuation-in-part of Ser. No. 270,034, July 10, 1972, abandoned. This application Mar. 25, 1974, Ser. No. 454,607

Claims priority, application United Kingdom, Feb. 1, 1974, 4731/74

Int. Cl.² F01N 7/20

U.S. Cl. 180—64 A **17 Claims**



1. In combination with a surface vehicle, at least one chamber mounted to said vehicle such that said chamber is disposed in the air-flow past said vehicle when said vehicle is in motion, said chamber having an exhaust gas inlet and an exhaust gas outlet, the flow of exhaust gases between said inlet and outlet being substantially unidirectional and parallel to the air-flow past said vehicle, said discharge outlet comprising an elongated aperture arranged to discharge the flow of exhaust gases from said chamber in a direction substantially parallel to the direction of air-flow past said vehicle and at least one aerofoil member mounted externally of said chamber in the air-flow past said vehicle, said aerofoil member being oriented relative to said elongated aperture to effect an increase in air-flow velocity past said aperture during forward motion of said vehicle.

3,952,824

RIGID REAR AXLE FOR MOTOR VEHICLES

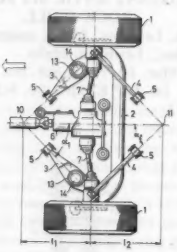
Wolfgang Matschinsky, Munich, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Germany

Filed Apr. 10, 1974, Ser. No. 459,799

Claims priority, application Germany, Apr. 11, 1973, 2318231

Int. Cl.² B60G 7/02

U.S. Cl. 180—73 D **23 Claims**



1. A rear axle assembly for motor vehicles comprising:

rear axle gear means for driving wheels of a vehicle by way of drive shafts, said rear axle gear means being supported by a fixed vehicle parts,

an axle member supporting said wheels, said axle member being capable of substantial vertical movement relative to said rear axle gear means, and

guide means for suspending said axle member from fixed vehicle parts, said guide means including four guide members of approximately the same length, each of said four guide members being arranged approximately at an angle of 45° to the driving direction as viewed in plan view,

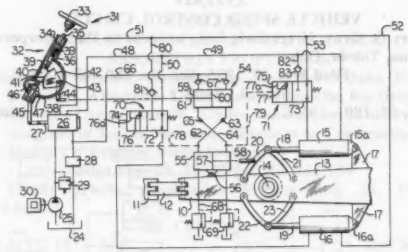
wherein said four guide members include two lower guide members extending forwardly and two upper guide members extending rearwardly, each of said four guide members being pivotally connected at one end to the axle member in proximity to a respective wheel with the points of pivotal connection of a respective upper guide member and lower guide member being disposed approximately one above the other, and the respective forward and rearward points, formed by the intersection of lines extending parallel to the longitudinal dimension of each of said two lower guide members and each of said two upper guide members, defining a connecting line being arranged such that the forward point of intersection is at most at the height of the rearward point of intersection, and

wherein at least said two upper guide members are arranged sloping down rearwardly, as viewed in side view.

3,952,825
HYDRAULIC STEERING SYSTEM FOR ARTICULATED VEHICLES

Marvin Edward Beyers, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 7, 1975, Ser. No. 593,593
Int. Cl.² B62D *5/06*
U.S. Cl. 180—139 **14 Claims**



1. In a wheeled vehicle having two members connected by an upright joint about which the members pivot for steering the vehicle, a steering wheel on one of said members, a hydraulic system including two fluid operated jacks coupled between said members on opposite sides of the joint for effecting said pivoting, each of said jacks having a head end and a rod end provided with fluid connections, a constant displacement hydraulic pump in said system which is driven from the vehicle engine, a three position control valve in said system, a valve control element operable by rotation of the steering wheel for moving said control valve between a neutral position and two offset positions for simultaneously driving both jacks to pivot the members in a desired direction, and follow-up means in said system which includes a master cylinder coupled between the wheeled members for detecting pivoting at the joint, together with a slave cylinder hydraulically connected to the master cylinder for synchronized movement therewith, said slave cylinder being coupled to the valve control element to move said element in a direction opposite to that produced by turning of the steering wheel, the improvement comprising:

means for sensing back pressure in the system resulting from insufficient fluid volume for driving the jacks and followup system as rapidly as is required by the speed of steering wheel rotation;

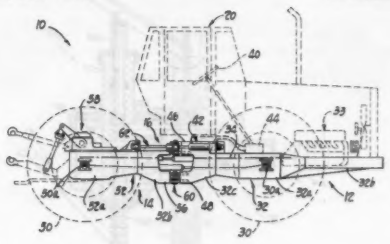
selector valve means which has a normal position, said selector valve means being movable from said normal position in response to the sensing of back pressure by said sensing means;

and fluid connections between said selector valve means, the control valve, and the jacks to selectively direct substantially the entire flow of fluid from the pump to one of the two jacks, which is then an active jack, upon movement of the selector valve means from said normal position, while the other of said jacks is substantially idle.

3,952,826
ARTICULATED VEHICLE

Dean Marshall Barker, Rockford, and Mark Harold Sickman, Hopkins, both of Minn., assignors to White Farm Equipment Company, Cleveland, Ohio

Filed Apr. 4, 1974, Ser. No. 457,997
Int. Cl.² B62D *5/10*
U.S. Cl. 180—136 **13 Claims**



1. In an articulated vehicle comprising:

a. a first vehicle section comprising a first frame supported by ground engaging members;

b. a second vehicle section comprising a second frame supported by ground engaging members; and,

c. articulating means for interconnecting said first and second vehicle sections and comprising:

i. universal joint means connected between said first and second frames defining a vertically extending steering axis about which said first and second vehicle sections are relatively pivoted to enable steering of the vehicle;

ii. pantograph linkage means interconnecting said vehicle sections and comprising a first link structure pivoted to one of said vehicle sections in substantial alignment with said vertical axis and having portions which extend laterally oppositely away from said axis, second and third links connected to respective lateral portions of said first link structure and extending to connecting locations on the other of said vehicle sections, said connecting locations and said other vehicle section defining a fourth link structure of said pantograph linkage means; and,

iii. steering actuator means connected to said one vehicle section and cooperating with said pantograph linkage means to provide for articulation of said vehicle sections about said steering axis.

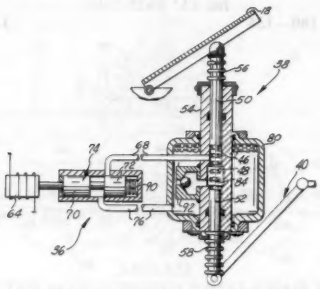
3,952,827
ACCELERATION CONTROL SYSTEM

Gilbert H. Drutchas, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Nov. 7, 1974, Ser. No. 521,939
Int. Cl.² B60K *31/00*
U.S. Cl. 180—82 R **8 Claims**

1. An apparatus for use in a vehicle having nondriven and engine driven wheels, said apparatus comprising throttle actuator means operable against the influence of a biasing force to increase the operating speed of the engine, said throttle actuator means including input and output members and variable volume chamber means for holding a body of fluid for transmitting pressure forces between said input and output members, said chamber means including surface means for defining a longitudinally extending chamber having openings at opposite ends thereof, said input member extending through one of said openings into said chamber, said output member extending through the other opening into said chamber, said body of fluid being disposed in said chamber between said input and output members, said input member being movable relative to said surface means to effect movement of said

output member relative to said surface means under the influence of fluid pressure forces transmitted from said input member to said output member by the body of fluid, sensor means for detecting when the rate of rotation of a driven wheel exceeds the rate of rotation of a nondriven wheel by more than a predetermined amount, and control means for effecting a variation in the volume of said variable volume chamber means from a first volume to a second volume to effect relative movement between said members and a decrease in engine speed in response to detection of a rate of driven wheel rotation which exceeds the rate of nondriven wheel rotation by more than the predetermined amount to thereby decrease the rate at which the driven wheel is rotated by the engine and for maintaining the volume of said chamber means constant at said second volume during continued operation of the vehicle with the rate of rotation of the driven wheel exceeding the rate of rotation of the nondriven wheel by an amount which is less than the predetermined amount.



3,952,828

AUTOMATIC STEERING SYSTEM FOR ROW-CROP HARVESTER AND SENSOR THEREFOR

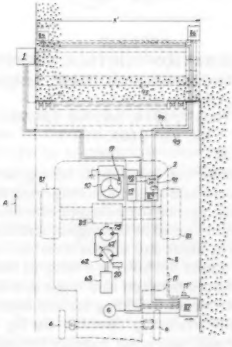
Michael Stampfer, Gottmadingen; Ewald Graeber, Weiterdingen; Helmut Oni, Gottmadingen, and Ernst Rüede, Bietingen, all of Germany, assignors to Maschinenfabrik FAHR AG, Gottmadingen, Germany

Filed Dec. 16, 1974, Ser. No. 532,859

Claims priority, application Germany, Jan. 3, 1974, 2400125; Dec. 18, 1973, 2362899

Int. Cl. B62d *5/00*

U.S. Cl. 180—97 **6 Claims**



1. An automatic steering system for a standing-crop harvester having a chassis adapted to travel along the ground in a transport direction determined by guide wheels on said chassis and carrying a cutter for cutting a swath in the crop, said system comprising:

front sensor means on said chassis to one side of and ahead of said cutter in said transport direction for detecting the edge of uncut standing crop and generating an output corresponding to the position of said edge relative to said chassis;

back sensor means on said chassis to the other side of and behind said cutter in said transport direction for detecting the edge of a swath made by said cutter and generating an output corresponding to the position of the swath edge relative to said chassis;

steering means on said chassis operable by said outputs and connected to said guide wheels for guiding said chassis along the edge of said uncut crop; and

cutout means including a detector on said chassis ahead of said cutter and inboard of both of said front and back sensor means and connected between said front sensor means and said steering means for disconnecting said front sensor means from said steering means during detection of a gap in said crop ahead of said cutter and between said front and back sensor means and for simultaneously connecting said back sensor means to said steering means for operating said steering means with said output of said back sensor means.

3,952,829

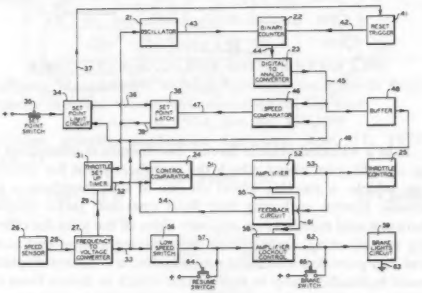
VEHICLE SPEED CONTROL CIRCUIT

Larry O. Gray, Greensfork, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed May 22, 1975, Ser. No. 580,063

Int. Cl.² **B60K** *31/00*

U.S. Cl. 180—105 E **11 Claims**



1. In a vehicle having a source of a pulsed vehicle road speed signal of a frequency proportional to the vehicle road speed and a throttle control means, a speed control circuit for automatically maintaining the speed of the vehicle at a desired road speed, comprising:

means actuated by the vehicle operator when the vehicle reaches the desired road speed and responsive to the first vehicle road speed signal pulse to occur after said actuation for generating a first signal having a magnitude which is a function of the time elapsed from the occurrence of said first pulse;

means responsive to said first pulse generating a second signal having a magnitude which is a different function of the time elapsed from the occurence of said first pulse;

means for comparing the magnitudes of said first and second signals and for terminating the generation of said first signal when said magnitudes coincide wherein said means for generating said first signal stores said first signal as the desired road speed signal; and

comparator and control signal generating means responsive to the vehicle road speed signal and said desired road speed signal for generating a control signal to have the

throttle control means to maintain the speed of the vehicle at the desired road speed.

3,952,830

MINERAL AGGREGATE (PERLITE) ACOUSTICAL BOARD

Otto A. Oshida, Fountain Valley; John B. Gilmour, Whittier, and Nadeem U. Siddiqui, Torrance, all of Calif., assignors to Grefco, Inc., Los Angeles, Calif.

Filed May 7, 1974, Ser. No. 468,008
Int. Cl.² E04B 1/99
U.S. Cl. 181—33 G **11 Claims**

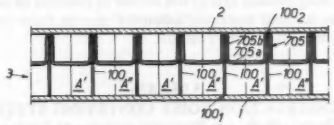
1. A monolithic acoustical panel comprising by weight,
a. 45 to 75% of an expanded volcanic glass of which 65–100% will pass an 8 mesh U.S. Standard screen and will be retained on a 50 mesh U.S. Standard screen, said expanded volcanic glass having a bulk density of about 6 to 15 lbs./cu.ft.;
b. 10 to 30% of mineral fiber;
c. 10 to 20% of nongelatinous cellulosic fiber having lengths in the range of about 0.5 to 3.5 mm.; and
d. 10 to 25% total of binder and sizing agent.

3,952,831

COMPOSITE MATERIAL WITH ACOUSTIC ABSORPTION PROPERTIES

Jean-Paul Bernard, Dammarie-les-Lys; Pierre Jules Henry Brussieux, Alfortville; Louis Francois Jumelle, Ris-Orangis, and Jean Lucien Simonin, Issy-les-Moulineaux, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Feb. 25, 1975, Ser. No. 552,744
Claims priority, application France, Feb. 26, 1974, 74.06433
Int. Cl.² E04B 1/74
U.S. Cl. 181—33 G **25 Claims**



1. A composite material with acoustic absorption properties of the sandwich type comprising, two substantially parallel skins one of which is cut-out by orifices while the other is devoid of orifices, a core of cellular structure disposed between said two skins and composed of a plurality of cells each of which extends from one skin to the other, a plurality of small plates inserted into said cellular structure made of material with high acoustic resistivity, and an active part for each of said cells contained in a plane substantially parallel to the said skins, the said plane being common to the respective active parts of all the said small plates, so that the said active parts form, together, the acoustic equivalent of an intermediary wall with high acoustic resistivity dividing, in the direction of thickness, the said cellular structure into two superposed layers each formed by a mass of sub-cells.

3,952,832

PULSED HIGH PRESSURE LIQUID PROPELLANT COMBUSTION POWERED SEISMIC SOURCES

Lester C. Elmore, Portola Valley, and Thomas M. Broxholm, Palo Alto, both of Calif., assignors to Pulsepower Systems, Inc., San Carlos, Calif.

Division of Ser. No. 869,660, Oct. 27, 1969, Pat. No. 3,620,313. This application Mar. 29, 1971, Ser. No. 129,208
Int. Cl.² G01V 1/06
U.S. Cl. 181—116 **5 Claims**

1. A method of producing a sound wave from a seismic source for exploration purposes, said method comprising, loading a quantity of a liquid propellant into a container, said liquid propellant including a fuel and an oxidizer of the group comprising a liquid or a solid in a slurry form, said liquid propellant being a high energy density liquid which burns to produce high combustion chamber pressures, said liquid propellant also being a liquid which can be ignited in the bulk mode without the need to vaporize the propellant prior to ignition, placing the container in the position desired for the initiation of the sound wave, igniting the liquid propellant in the bulk mode without vaporizing the propellant prior to ignition by actuating an igniter mechanism and tranferring the high pressure expansion pulse produced by the bulk burning of the small quantity of the liquid propellant from the container to the media to produce the sound wave in the media surrounding the container and wherein the container has a combustion chamber defined by a cylinder and a piston reciprocable within the cylinder and acoustic ports extending through the walls of the cylinder and located to be uncovered by downward movement of the piston in the cylinder, and said method including placing the container underwater and burning the liquid propellant in the combustion chamber to produce high pressure gases, expanding the high pressure gases produced in the combustion chamber and ejecting the expanded gases through acoustic ports to produce a bubble pulse sound wave in the water surrounding the container.

3,952,833

METHOD AND APPARATUS FOR GENERATING PRESSURE WAVES IN WATER BY IMPLOSION

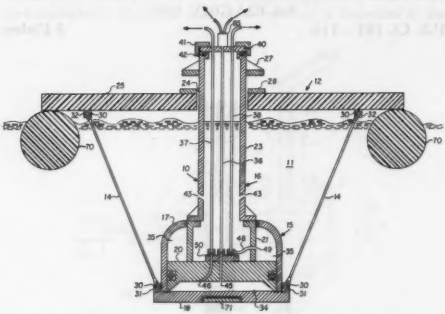
Dale H. Reed, and Alpheus A. Franklin, both of Dallas, Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 26, 1974, Ser. No. 536,356
Int. Cl.² G01V 1/38; G01K 11/00
U.S. Cl. 181—118 **18 Claims**

1. A device for generating acoustic waves by implosion of a vapor bubble in water comprising:

a. means defining an expansible sealed combustion chamber between a rigid lower member and a rigid upper member telescoping therein so as to permit limited relative vertical movement therebetween;

b. means for supporting said lower member beneath the surface of the water so as to apply a predetermined restraint to downward movement thereof; and



c. means for confining an explosion within said chamber to lift said upper member and to thereby transmit a further lifting force to said lower member, whereby said vapor bubble is created beneath and adjacent said lower member.

3,952,834

EMBEDDED TYPE SPEAKER WITH OVER LYING GRILL

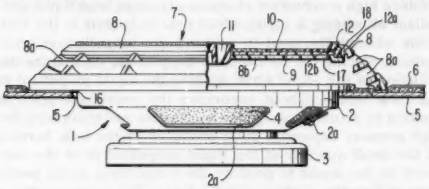
Hiroshi Soma, Tokyo; Yutaka Tamura, and Kenzo Miyazawa, both of Tokorozawa, all of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 18, 1974, Ser. No. 515,954

Claims priority, application Japan, Oct. 18, 1973, 48-120848[U]; Oct. 18, 1973, 48-120849[U]

Int. Cl.² H05K *5/00*

U.S. Cl. 181—150 **6 Claims**



1. In an embedded type speaker of the type wherein a speaker body is mounted within a opening formed within a wall and a grill is mounted in front of the speaker body and overlying the opening and the speaker body, the improvement comprising: said grill consisting of an annular grill frame having circumferentially spaced sound communicating holes within a peripheral portion thereof, said peripheral portion defining a central opening, said grill including a supporting portion extending transversely across said grill frame central opening from one side to the other and at least a circular grill sheet spanning said opening in front of said supporting portion to close off the central opening of the grill frame, and having an external surface appearance compatible with the exterior surface of the wall supporting the speaker body and the grill, means for mounting said grill sheet to the peripheral portion of the annular grill frame, said means for mounting said grill sheet to said annular grill frame comprises an annular elastic packing interposed between the inner periphery of said annular grill frame and the outer periphery of said circular grill sheet and means including said annular packing for pressing the peripheral edge of said circular grill sheet against said annular grill frame to prevent vibration therebetween, and a mounting member for connecting the center of the grill sheet to said supporting portion.

3,952,835

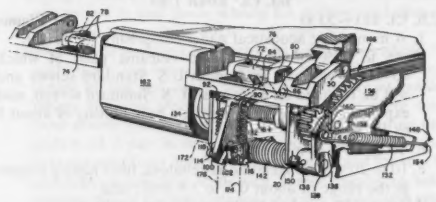
FLAT TORQUE RATE DRIVE SYSTEM

Igor Blinow, Millis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 246,715, April 24, 1972, Pat. No. 3,894,294. This application Nov. 18, 1974, Ser. No. 524,756

Int. Cl.² F03G *1/00*; **G03B** *19/12*

U.S. Cl. 185—11 **12 Claims**



1. Apparatus for use with a reflex camera of the type having a frame and an operator assembly movably mounted on said frame for movement from a first position in which it functions as a focusing screen to a second position in which it functions as a reflex member for reflecting the image of a subject toward an exposure plane; said apparatus including: erecting means engageable with said operator assembly for moving said operator assembly from said first position to said second position and thence to said first position when in engagement with said operator assembly, said erecting means comprising a shaft rotatably securable to said frame and a crank arm secured to said shaft for rotation therewith, and spring drive means connected to said erecting means to deliver a generally uniform torque to said erecting means, said spring drive means including a first spring connected to said shaft and connectable to said frame for providing an output torque which decreases as said operator assembly moves from said first position to said second position and a tension spring that provides an output torque which increases as said operator assembly moves from said first position to said second position, said tension spring being connectable between said crank and said frame such that its extension decreases and the perpendicular distance from its longitudinal axis to the center of rotation of said shaft increases as said operator assembly moves from said first position to said second position.

3,952,836

CONSTRUCTION HOIST CONVEYING SYSTEM

Jozsef Thoma, Budapest, Hungary, assignor to Linden-Alimak AB, Skelleftea, Sweden

Filed Sept. 27, 1973, Ser. No. 401,488

Claims priority, application Hungary, Sept. 27, 1972, TO 889

Int. Cl.² B65G *37/00*, *49/00*; **B66B** *9/18*; **E04G** *21/04*

U.S. Cl. 187—2 **5 Claims**

1. In the known type of hoisting arrangement that is useful in connection with the construction of a high tower-like structure and which includes a vertically movable carrier frame for transporting a load from a loading position adjacent the base of the tower-like structure to an elevated working platform which rises as to the tower-like structure rises, the improvement in said carrier frame which comprises:

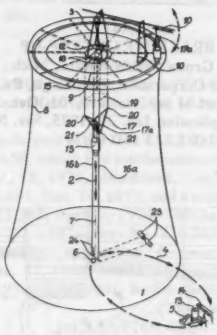
a. two mutually independent hoisting ropes arranged to suspend said carrier frame,

b. said carrier frame having a shape corresponding to that achieved by bending a rhombus along its shorter diagonal to form a V-shaped configuration,

c. two hoist connection points for the hoist ropes located on said carrier frame at points on said carrier frame corre-

sponding to the ends of the longer diagonal of said rhombus,

d. two guiding connecting points for the hoist ropes located on said carrier frame at points on said carrier frame



corresponding to the ends of the shorter diagonal of said rhombus,

e. said two hoist connection points being located at a higher level on said frame than said two guiding connection points.

3,952,837

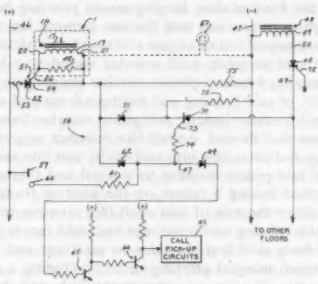
SIGNALING SYSTEM FOR AN ELEVATOR

Lyman A. Rice, Grafton, Wis., assignor to Armor Elevator Company, Louisville, Ky.

Filed Nov. 1, 1974, Ser. No. 520,026

Int. Cl.² B66B 1/46

U.S. Cl. 187—29 R **22 Claims**



1. An elevator system connected to a structure having a plurality of landings comprising an elevator car, means mounting said car for movement relative to the structure to serve said landings, and control means moving said car and stopping said car, said control means including signaling means having means providing first and second permanent magnetic poles, output means including core means electromagnetically coupled to coil means and selectively providing a signaling output, flux conducting means connecting said core means and said first pole, and means pivotally connected to said core means and including a first portion magnetically coupled to said core means and to said second pole and a second portion including resilient means selectively manually actuated and rapidly varying the magnetic coupling between said first portion and said second pole to provide said signaling output indicative of the manual operation.

3,952,838

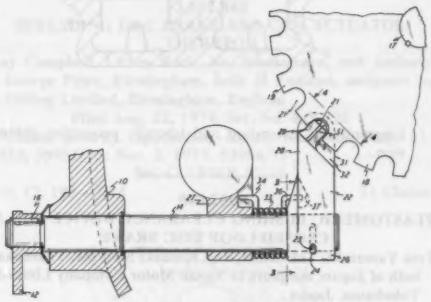
TRANSMISSION PARK-LOCK MECHANISM

John H. Osten, Caledonia; Peter D. Ruffalo, and Donald L. Johnson, both of Kenosha, all of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 17, 1975, Ser. No. 559,125

Int. Cl.² B60T 1/06

U.S. Cl. 188—31 **6 Claims**



1. A transmission park-lock mechanism comprising a rotatable transmission shaft, a gear mounted on said shaft for rotation therewith and including side portions and including peripheral teeth, an additional shaft rotatably mounted and at an angle relative to the axis of the first said shaft, a latch mounted on said additional shaft and to one side of said gear for movement in the plane transverse to the axis of said additional shaft and toward said gear for engagement with the teeth of said gear in response to rotation of said additional shaft for restraining said gear from rotating, said latch having a tooth adjacent to and facing said one side of said gear and an abutment portion remote from said gear, said abutment portion extending into abutment with said gear when said latch is engaged with the teeth of said gear, to thereby limit the movement of said latch toward said gear and align said latch tooth into engagement with said gear teeth, a spring engaged with said latch for yieldingly urging said latch into the engaged position with said gear teeth, a lost motion connection between said additional shaft and said latch and having a limit position for limiting the movement of said latch relative to said shaft and with said limit position being arranged to permit said latch abutment portion to move into contact with said gear, and a control member on said additional shaft for rotating the latter and thereby move said latch into and out of engagement with said gear.

3,952,839

RAIL TRACKWAY FITTED WITH BRAKING DEVICES

Patrick R. Brown, Zumikon, and Max A. Buehler, Thalwil, both of Switzerland, assignors to Weelpal, A. G., Zug, Switzerland

Filed Dec. 19, 1974, Ser. No. 534,413

Claims priority, application Switzerland, Dec. 20, 1973, 18118/73; July 18, 1974, 10025/74

Int. Cl.² B61K 7/02

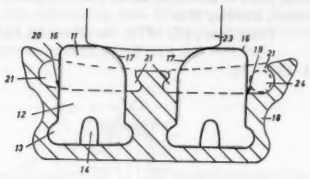
U.S. Cl. 188—62 **8 Claims**

1. In combination, a rail trackway provided with braking devices which are arranged at predetermined intervals and consist of elastically deformable braking bodies, the improvement comprising:

said braking devices in the form of beads which are inserted into the trackway and which project in the unloaded state beyond the surface of said trackway and being made of elastic material having high inherent damping;

receiving means along one of the rails of said rail trackway comprising two parallel extending groove-like channels, for the reception of the braking bodies; and,

the lower part of said braking body which sits in the track being symmetrical and having along its lower edges a



longitudinally extending and laterally projecting extension.

3,952,840

ELASTOMERIC BUSHING CLEARANCE DEVICE FOR A CLOSED-LOOP DISC BRAKE

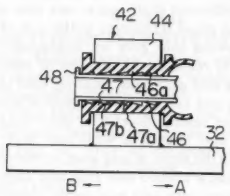
Tetu Yamazaki, Yokohama, and Kazuaki Shimizu, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed Dec. 23, 1974, Ser. No. 535,681

Claims priority, application Japan, Dec. 28, 1973, 48-147847[U]

Int. Cl.² F16D 65/54

U.S. Cl. 188—71.8 **4 Claims**



1. A disc brake of a wheeled vehicle, including:

a rotatable braking disc;

a stationary hydraulic cylinder having inner and outer pistons slidable in opposite directions which are substantially parallel to the axis of said braking disc, said pistons defining a fluid chamber therebetween into which fluid under pressure is supplied when braking;

directly and indirectly actuated friction pad assemblies positioned adjacent to opposite faces of said braking disc, said directly actuated friction pad assembly being in abutting engagement with said inner piston which forces it against said braking disc when said inner piston is moved by said fluid;

a yoke movable in a direction parallel to said axis of said braking disc by said outer piston to move said indirectly actuated friction pad assembly; and

two guide means for guiding said yoke in said direction parallel to said axis of said disc to allow smooth engagement of said indirectly actuated friction pad assembly with said braking disc, each of said guide means including a support member provided with a bore therethrough and fixed to said yoke, a guide rod secured to a portion of said stationary hydraulic cylinder and passing through the bore of each said support member, said guide rod securely provided with a cylindrical collar around the periphery of said guide rod, the improvement comprising an elastomeric bushing tightly disposed between the inner surface of said bore of each said support member and the outer peripheral surface of said cylindrical collar and secured to each said support member, each said elastomeric bushing being, at its portion contacting the outer peripheral surface of said cylindrical collar, configured to slide on the outer peripheral surface of said cylindrical collar, in a direction for applying the brake, with a lower friction resistance than that in the reverse direction for releasing the brake.

3,952,841

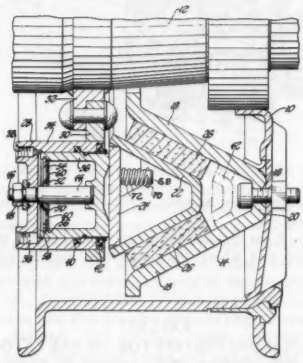
DISC BRAKE WEAR TAKE-UP

William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 410,701, Oct. 29, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,622

Int. Cl.² F16D 65/54

U.S. Cl. 188—71.8 **5 Claims**



1. A brake assembly comprising: support means; a friction element directly supported by said support means for movement into and out of frictional engagement with a friction disc to apply a braking force thereto; an actuator supported by said support means for moving said friction element into engagement with the friction disc; biasing means reacting between said supporting means and said friction element for moving said friction element out of engagement with the friction disc and against said actuator; said actuator including a housing defining a cavity, a hollow piston member slidably supported in said cavity of said housing and having a front end engageable with said friction element, said piston member being open from the rear end thereof, a shaft-like member supported by said housing and extending into said cavity and into said open rear end of said piston member to a distal end thereof, said piston member having a recess on the interior thereof and extending about the axis of said shaft-like member to define a first shoulder facing said open rear end, said recess extending axially from said first shoulder to said rear end of said piston member, integral gripping means including a conical gripping portion in gripping engagement with said shaft-like member for moving along said shaft-like member only in the direction toward said distal end of said shaft-like member and a disc-like support portion extending radially of said gripping portion and into said recess for movement axially toward and away from said first shoulder, said piston member having a groove on the interior thereof extending about the axis of said shaft-like member, said groove being disposed in said recess and axially spaced from said first shoulder in the direction of said rear end, retaining means disposed in said groove and defining a second shoulder axially spaced from said first shoulder to define a channel between said shoulders, said retaining means being annular with an inner opening surrounding and disposed radially outwardly of said conical gripping portion, said disc-like support portion of said gripping means being disposed in said channel between said first and second shoulders, the distance between said shoulders being greater than the thickness of said disc-like support portion whereby said

gripping portion may move along said shaft-like member toward said friction element to compensate for wear of said friction element and whereby said disc-like support portion of said gripping means is allowed to move axially between said shoulders to allow said piston to retract to allow said biasing means to move said friction element out of engagement with said friction disc.

3,952,842

SPREADING DISC BRAKE AND ACTUATOR STRUCTURE

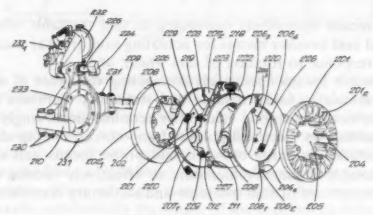
Hermann Klaue, Tour d'Ivoire 24 e, 1820 Montreux, Switzerland

Continuation-in-part of Ser. No. 288,287, Sept. 12, 1972, Pat. No. 3,885,650, which is a continuation-in-part of Ser. No. 73,566, Sept. 18, 1970, abandoned, Continuation-in-part of Ser. No. 415,681, Nov. 14, 1973, and a continuation-in-part of Ser. No. 457,261, April 2, 1974. This application May 15, 1974, Ser. No. 470,303

Claims priority, application Germany, Dec. 2, 1969, 1960286; Dec. 27, 1969, 1965171; Dec. 27, 1969, 1965170; Aug. 25, 1973, 2343004; Switzerland, Nov. 17, 1972, 16741/72

Int. Cl.² F16D 55/04

U.S. Cl. 188—71.4 9 Claims



1. A fully lined disk brake assembly for a vehicle wheel comprising

a brake housing comprising an annular member having an annular gap of channel-like cross-section open on its radially exterior side, said channel-like gap having inner sides which provide annular braking sufaces, said brake housing being attached to be rotatable jointly with a wheel of an assembly to be braked;

at least one pair of segmental disk brake shoes disposed from the radially exterior side into the channel-like gap having friction races facing the adjacent braking surface;

means for non-rotatably supporting each pair of brake shoes in the gap comprising a pair of diametrically opposite members attachable to a non-rotating part of a brake and wheel assembly, at least one of the pair being adapted to be removed from over the open side to permit replacement of the brake shoes without dismantling the means for actuating the brake shoes; and

means for moving said brake shoes into contact with said braking surfaces disposed between the brake shoes and comprising thrust rings disposed between and against the brake shoes, said thrust rings having means adapted to be disposed on the said diametrically opposite members which extend over the open side of the channel to support the thrust rings in the channel between the brake shoes, a pair of actuating rings disposed between the thrust rings, a pair of concentric races filled with ball-bearings extending around the peripheries of a first of said actuating rings facing a first thrust ring, a pair of concentric races filled with ball-bearings around the peripheries of the second thrust ring and facing the second of said actuating rings, and a plurality of circumferentially spaced slot-like races each having a ball-bearing therein disposed to contact the second thrust ring and the first actuating ring between the concentric bearing races when the actuating rings and thrust rings are associated together between the brake shoes, whereby rotation of the actuating rings moves the thrust rings and the brake shoes towards the braking surface;

said brake shoes having an extension means thereon which is associated with said members to support the brake shoes in the gap.

3,952,843

SPREADING DISC BRAKE AND CAM ACTUATOR THEREFOR

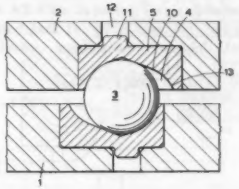
Roy Campbell, Lickey Rock, Nr. Bromsgrove, and Anthony George Price, Birmingham, both of England, assignors to Girling Limited, Birmingham, England

Filed Aug. 22, 1974, Ser. No. 499,795

Claims priority, application United Kingdom, Aug. 23, 1973, 39951/73; Nov. 2, 1973, 51086/73

Int. Cl.² F16D 55/16

U.S. Cl. 188—71.4 11 Claims



1. An insert for a pressure plate in a brake of the spreading disc kind which includes pressure plates having opposed cooperating camming surfaces thereon and balls co-operating with said surfaces to spread said plates upon relative rotation therebetween, said inserts comprising a circular member adapted to be rotatably mounted in a recess in a pressure plate and incorporating on one face a straight groove having a longitudinal axis and of progressively varying depth along said axis for co-operation with a ball located in the groove and in a complementary groove in an insert in a co-operating pressure plate, the circular member also incorporating on a face opposite said one face a rearwardly projecting peg adapted to be received in an opening in the pressure plate offset from the axis of the circular member.

3,952,844

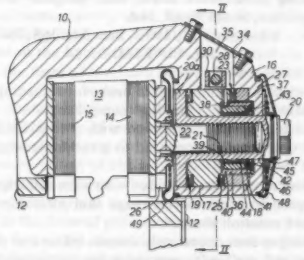
HELICAL CAM ACTUATOR FOR A DISC BRAKE

Charles Newstead, Walsall, and Robert Joseph Warnock, Stourport-on-Severn, both of England, assignors to Girling Limited, Birmingham, England

Filed Jan. 13, 1975, Ser. No. 540,452

Int. Cl.² F16D 55/08

U.S. Cl. 188—72.8 13 Claims



1. In a vehicle brake system: a mechanical brake actuator comprising relatively rotatable cam components, two complementary axially cooperating parallel helical cam tracks respectively on said cam components, and a helical thrust bear-

ing between said components comprising a plurality of rolling members between said two cam tracks said cam components being constructed and arranged that rotation of one of said cam components in an appropriate direction relative to the other of said cam components effects axial displacement of said one cam component relative to said other cam component.

3,952,845

BRAKE ADJUSTERS

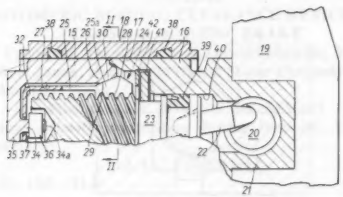
Anthony Asquith, Nuneaton, England, assignor to Girling Limited, Birmingham, England

Filed Feb. 18, 1975, Ser. No. 550,717

Claims priority, application United Kingdom, Feb. 16, 1974, 7157/74

Int. Cl.² F16D 65/56

U.S. Cl. 188—196 D **23 Claims**



1. A slack adjuster for a vehicle brake system which includes first and second members having a reversible screw-thread connection therebetween for effecting relative rotation therebetween in one direction of axial load between said first and second members, said second member having a plurality of individual portions disposed circumferentially with respect to said first member and having respective portions of said screw-thread connection, a third member, each of said portions of said second member and said third member having interengageable wedging surfaces thereon effective upon axial loading in a direction opposite to said one direction for urging relative radial displacement between said first member and said portions of said second member to hold the first and second members in frictional engagement with one another at said reversible screw-thread connection to prevent reverse relative rotation therebetween, and spring means effective in a radial direction on each of said portions of said second member to bias such portions towards said first member at said reversible screw-thread connection to inhibit undesired rotation at said reversible screw-thread connection.

3,952,846

ELECTROSTATICALLY COOLED BRAKE

Chung Ping Han, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed June 11, 1973, Ser. No. 368,784

Int. Cl.² F16D 65/84

U.S. Cl. 188—264 R **2 Claims**

1. An electrostatically cooled brake for retarding movement of a rotatable wheel or the like comprising:

a rotatable member provided with a first friction surface and operatively connected to a rotatable wheel for rotation therewith;

a stationary member provided with a second friction surface adapted to frictionally engage said rotatable member to retard rotation thereof;

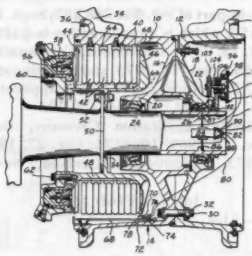
actuating means operatively connected to one of said rotatable and stationary members for actuating the same to cause frictional engagement of said first and second friction surfaces;

a source of electric power provided with negative and positive charge terminals;

probe means electrically connected to one of said terminals and electrically charged accordingly and arranged in spaced apart relationship to said rotatable and stationary members;

coil means operatively connected to said electrical connection between said probe means and said one terminal for increasing the voltage applied to said probe means;

breaker means operatively connected to said electrical connection for intermittingly interrupting the electrical flow to said coil means;



cam means operatively connected to said rotatable wheel and said breaker means for actuating said breaker means in response to rotation of said wheel; and

conductor means operatively connecting the other of said terminals to said rotatable and stationary members for electrically charging said other terminal accordingly to establish an electrical potential and corresponding electrostatic discharge between said probe means and said rotatable stationary members to effectively reduce the temperature of said rotatable and stationary members.

3,952,847

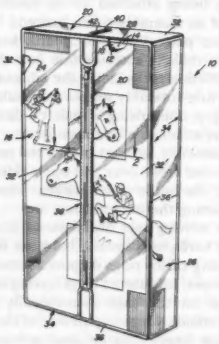
WEATHERPROOF ARTICLE ENCLOSURE

Hazel H. Via, Box 7429-V Wyndotte St., Rte. No. 1, Sarasota, Fla. 33577

Filed May 28, 1975, Ser. No. 573,139

Int. Cl.² B65D 85/18

U.S. Cl. 190—41 Z **3 Claims**



1. A weatherproof article enclosure for sporting equipment and accessories, comprising, in combination:

a. a bag constructed from a flexible, planar material arranged forming an article receiving cavity and provided with an opening communicating with the cavity for facilitating access to the cavity;

b. a transparent sheet material arranged over, contacting, and connected to the planar material for protecting the planar material and weatherproofing the bag, said planar

material including an opaque, print fabric arranged with a pattern of the fabric facing the sheet material for viewing the pattern through the sheet material, protions of said planar material being attached along seams to form the bag with the sheet material being connected to the planar material at the seams, and leather welting covering the seams for facilitating attachment of the planar material portions to one another and to the sheet material, and assuring weatherproofing of the bag.

3,952,848
SECTION INSULATORS OF ELECTRIC TRACTION SYSTEMS

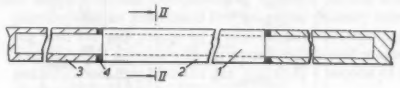
Wilfred Arthur Walker, Harrow, and Joseph Littler, Huyton, both of England, assignors to BICC Limited, London, England

Division of Ser. No. 236,412, March 20, 1972, abandoned. This application May 8, 1974, Ser. No. 467,956

Claims priority, application United Kingdom, Mar. 24, 1971, 7697/71

Int. Cl.² B60M *5/00*; **B32B** *27/38*, *17/04*

U.S. Cl. 191—33 R **12 Claims**



1. A section insulator adapted to be inserted directly in a contact wire in an electric traction system having at least one vehicle constrained to move in at least one predetermined path and having a pick-up shoe, and at least one contact wire for supplying electric current to the said shoe comprising an elongate body of synthetic resin, reinforced with glass fibres or other fibres of high tensile strength, the improvement whereby substantially the whole of the exposed surface of said insulator is formed of a composition based on a cycloaliphatic epoxy resin cured with an acidic curing agent and having a running surface for engagement with said shoe that is continuous from end to end over at least a major portion of the length of the body and is formed by a composition comprising the cured reaction product of 100 parts of a cycloaliphatic epoxy resin, 40 – 250 parts of an acidic hardener therefor and an effective amount of an accelerator, and dispersed in the said reaction product 50 – 400 parts of a mineral filler substantially wholly in the form of particles not greater in any dimension than 80 micrometers and 10–100 parts of a low-friction fluorocarbon polymer.

3,952,849
SPRAG CLUTCHES

Edward Joseph Brownhill, Cheadle; Roy Heaton, Timperley, and Ralph Booth, Gatley, Cheadle, all of England, assignors to Renold Limited, Manchester, England

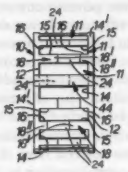
Filed May 12, 1975, Ser. No. 576,654

Claims priority, application United Kingdom, May 28, 1974, 23531/74

Int. Cl.² F16D *41/07*

U.S. Cl. 192—41 A **15 Claims**

1. In a sprag retainer assemblage for use in an annular gap defined between confronting cylindrical surfaces of inner and outer races of a sprag clutch to transmit uni-directional drive between the clutch driving and driven race, the assemblage comprising an annular sprag retainer, a ring of sprags in the retainer, and for each sprag, an energising spring individual to the sprag and comprising a spring arm for biasing the sprag into substantially line contact with the inner race of the clutch, by tilting the sprag about substantially a line of contact with the outer race of the clutch, an improved sprag retainer comprising axially extending bars having first lengthwise portions presenting sprag positioning faces acting to position the sprags circumferentially with respect to one another, and wherein each energising spring has a mounting portion at least in part enwrapping a further lengthwise portion of one of the bars, the



mounting portion thereby mounting the energising spring fixedly on the bar.

3,952,850
AUTOMATIC TICKET MACHINE

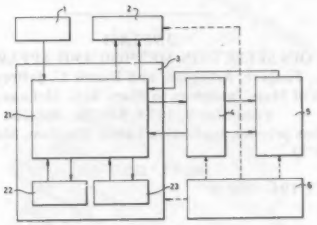
Carl-Axel Andersson, and Béla Farkas, both of Alvsjo, Sweden, assignors to AB Cale Industri, Gavle, Sweden

Filed Jan. 16, 1975, Ser. No. 541,619

Claims priority, application Sweden, Jan. 21, 1974, 7400728

Int. Cl.² G06F *9/00*

U.S. Cl. 194—1 N **14 Claims**



1. An automatic ticket machine for utilization in parking areas and comprising a casing provided with a coin unit including one or more coin apertures, pushbuttons for requesting a receipt and requesting coin refund, respectively, a window for displaying time information and coin denomination information, if desired, and openings for dispensing a ticket and a refunded coin, respectively, wherein said automatic ticket machine comprises:

a. a central unit including a time generator, current time registers, outgoing time registers, a temporary coin register, an outgoing coin register, a flag register, a pulse distributor, a supervisory unit, and a data table;

b. a display unit including said display window; and

c. a printing mechanism;

said supervisory unit operative to set said display unit to one of three conditions, namely unlit, lit with a steady light, and showing a flashing light, and operative to indicate electronically the time of the hour in the form of digits and the days of the week in the form of text; said display unit, when the automatic ticket machine is unactuated by coins, continuously showing the contents of the outgoing time register in the form of digits and in the form of text with a steady light; said outgoing time register receiving its information in binary coded decimal form by means of the supervisory unit from the current time registers, which always contain information on the current time; said current time registers receiving their time information in the form of pulses with predetermined intervals and derived from said supervisory unit, said pulses being initiated by the time generator over the flag register; said supervisory unit initiated by the flag register for addressing a portion of the data table, corresponding to an insert coin; the pulse distributor, upon a coin being introduced into the automatic ticket machine and under the control of the supervisory

unit, distributing to the temporary coin register a number of pulses corresponding to the value of the introduced coin; an address in the data table thereafter being changed by the supervisory unit to a time portion corresponding to the introduced coin, a number of pulses being derived from the time portion code of the data table, corresponding to the coin, and being distributed via the pulse distributor to the outgoing time registers, said number of pulses being added to the contents of the outgoing time registers; the addresses of the data table thereafter being changed again by the supervisory unit to a coin denomination portion corresponding to the introduced coin, a number of pulses derived from the coin denomination code of the data table, corresponding to the coin, being added to the outgoing coin register concurrently with the same number of pulses being subtracted from the temporary coin register; the above being repeated until the contents of the temporary coin register are equal to zero, so that the display unit shows the contents of the outgoing time registers in the form of digits and in the form of text, respectively, in a flashing light; the described process being repeated upon a new coin being introduced; and, when a request for a receipt is performed by external actuation of a pushbutton for requesting a receipt, the control unit being actuated over the flag register, thereby operating a motor of a printing mechanism, so as to perform printing on a ticket advanced therein, with the imprint corresponding to the contents of the outgoing time registers and the outgoing coin register with the display units being unlit during the printing process.

3,952,851
COIN SELECTION METHOD AND APPARATUS

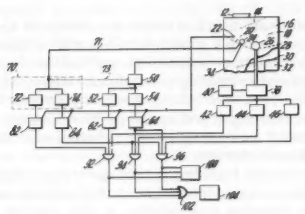
Guy L. Fougere, Arlington, and Dennis C. Jeffreys, Bedford, both of Mass., assignors to Mars, Inc., McLean, Va.

Filed May 8, 1974, Ser. No. 468,204

Claims priority, application United Kingdom, May 18, 1973, 23884/73

Int. Cl.² G07F *3/02*

U.S. Cl. 194—100 A **6 Claims**



1. Apparatus for examining conductive coins with respect to authenticity and denomination comprising

an oscillator circuit including an inductor arranged to subject a face of a coin to an electromagnetic field, wherein the presence of the coin or other conductive object within the field affects the frequency of the oscillator,

first means for producing a first alternating current signal representative of the output of the oscillator with respect to the effect of the presence of a coin within the field upon the amplitude of oscillations of the oscillator, said first means comprising a first detecting circuit having a time constant greater than one machine cycle to produce a reference signal, a second detecting circuit having a time constant greater than one period of oscillation of the lowest oscillator frequency and substantially less than 20 milliseconds, and a comparator to compare the output of the first detecting circuit with the output of the second detecting circuit,

second means for producing a second signal representative of the output of the oscillator with respect to the effect of the presence of a coin within the field upon the oscillator frequency,

means for comparing a value of each of the first and second signals respectively to correspondng values representative of an acceptable coin and indicating the presence of an acceptable coin, and

combinatorial means to produce a third signal when the comparing means indicate the presence in the field of an acceptable coin of the same denomination as indicated by the first and second signals.

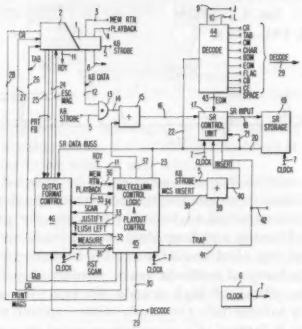
3,952,852
COLUMN FORMAT CONTROL SYSTEM

John Charlie Greek, Jr.; Michael Eudell McBride, and Howard Carl Tanner, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 22, 1975, Ser. No. 543,090

Int. Cl.² B41J *21/00*

U.S. Cl. 197—19 **11 Claims**



1. A system for causing corresponding portions of a plurality of text columns to be printed on the same print line to form a side-by-side column format prior to causing a printer carrier return, said system comprising:

a. memory means having said text columns sequentially stored therein;

b. means for causing a marking in said memory means of (1) initial print locations in each of said text columns for defining each beginning of the first of said corresponding portions of said text columns to be printed, prior to printing, and (2) after a portion of one of said text columns has been printed, a print location defining a beginning of the next portion to be printed from said one of said text columns on a subsequent print line;

c. means for defining locations for printing each of said text columns;

d. means for causing printing, from a print location, of a portion of one of said text columns on a print line in an appropriate one of said defined locations; and

e. means for causing printing, from print locations any corresponding portions from succeeding text columns on said print line in appropriate ones of said defined locations.

3,952,853
VERTICAL SHIFT MECHANISM

Edward Feldman, Teaneck, N.J., assignor to Litton Business Systems, Inc., Pinebrook, N.J.

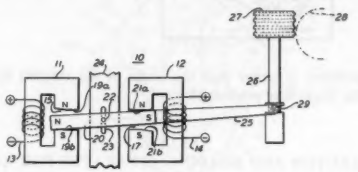
Filed Oct. 29, 1974, Ser. No. 518,394

Int. Cl.² B41J *1/32*

U.S. Cl. 197—55 **7 Claims**

1. A mechanism for shifting a print head containing a plurality of type bands into a number of operative positions comprising:

electromagnet means comprising core means and winding means;
said winding means being selectively coupled to a source of electrical energy for establishing a magnetic field;
actuating means for causing variations in said magnetic field;
a shifting element comprising magnet means in operative proximity to said magnetic means and being moved in response to said magnetic field;
said electromagnet means comprising a pair of electromagnets each having a core including a gap region defined by a pair of separated opposed pole faces and a winding;



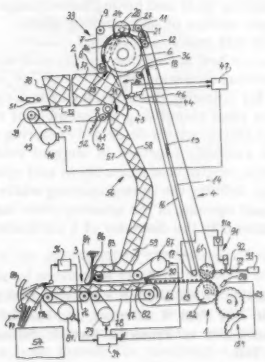
said magnet means comprising a member having a first portion with an associated first magnetic polarity extending into the gap region of a first of said electromagnets and a second portion with an associated second magnetic polarity extending into the gap region of a second of said electromagnets; and
a print head coupled to said shifting element;
said shifting element being movable into any one of a plurality of positions in accordance with variations in said magnetic field; whereby
said print head is correspondingly moved into any one of a plurality of positions.

3,952,854

APPARATUS FOR DIRECT AND CIRCUITOUS TRANSPORT OF CIGARETTES OR THE LIKE FROM MANUFACTURING TO PROCESSING MACHINES

Fritz Selonke, and Ulrich Bornfleth, both of Hamburg, Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg-Bergedorf, Germany

Filed Sept. 25, 1974, Ser. No. 509,123
Claims priority, application Germany, Sept. 27, 1973, 2348597
Int. Cl.² B65G *47/24*
U.S. Cl. 198—20 C **45 Claims**



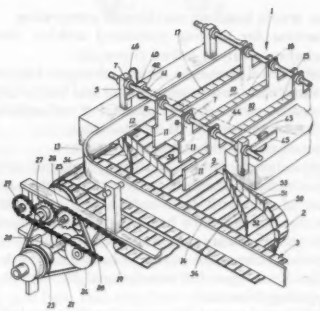
1. Apparatus for effecting and regulating the delivery of rod-shaped articles from a source which supplies articles at a first variable rate to a consumer which accepts articles at a second variable rate, particularly for effecting and regulating the delivery of smokers' products from a producing machine to a consuming machine, comprising first transporting means for moving articles from said source directly to said consumer along a first path; second transporting means for moving articles from said source to said consumer along a second path; switchover means actuatable to direct articles from said source into a selected path; a variable-volume magazine communicating with said second path; and means for changing the volume of said magazine in response to changes in the proportion of said rates so that the volume of said magazine increases and the magazine receives articles from said second path when said first rate exceeds said second rate and said volume decreases whereby said magazine feeds articles into said second path when said second rate exceeds said first rate.

3,952,855

HIGH SPEED BOTTLE TRANSFER MACHINE

James H. Rogers, Lebanon Junction, Ky., assignor to Mac Manufacturing Company, Inc., Lebanon Junction, Ky.

Filed Aug. 20, 1974, Ser. No. 498,995
Int. Cl.² B65G *47/30*
U.S. Cl. 198—32 **11 Claims**



1. A machine for feeding groups of articles in one-by-one fashion onto an outlet conveyor, which comprises
A. a longitudinal feed conveyor located at right angles to said outlet conveyor for receiving groups of articles and for moving same toward said outlet conveyor;
B. channel means comprising proximal middle and distal channel members disposed above said feed conveyor for orienting said articles into a plurality of side-by-side rows on said conveyor,
1. said distal channel member extending to the edge of said outlet conveyor;
C. the improvement of a spacing conveyor interposed between said feed conveyor and said outlet conveyor,
2. said spacing conveyor lying adjacent and parallel to said outlet conveyor and normal to said feed conveyor so as to receive articles from said feed conveyor for delivery onto said outlet conveyor,
2. the direction of the conveying surface of said spacing conveyor being opposite to the direction of the conveying surface of said outlet conveyor;
D. drive means for said spacing conveyor;
E. the further improvement of an obliquely disposed guide means on said spacing conveyor for simultaneously retaining, guiding and pushing articles transversely across said spacing conveyor, and onto said outlet conveyor in a one-by-one fashion.

3,952,856

APPARATUS FOR REGULATING ARTICLE-TREATING MACHINES THAT MAINTAIN AN ACCUMULATION OF ARTICLES AT AN INLET END

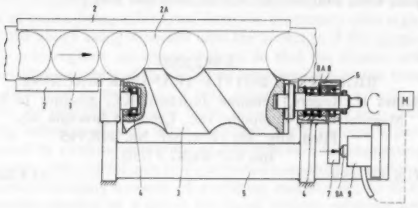
Lubor Kurzweil, Kondringen-Landeck, and Joachim Linde, Leiselheim, both of Germany, assignors to Firma Otto Sick KG, Metallwarenfabrik, Mundingen (Baden), Germany

Filed Aug. 16, 1974, Ser. No. 498,251

Claims priority, application Germany, Aug. 21, 1973, 2342252

Int. Cl.² B65G *43/08*

U.S. Cl. 198—37 3 Claims



1. An article handling mechanism comprising:

a machine for treating individual articles, said machine including a driven infeed conveyor;

said infeed conveyor being arranged for translational movement and having an inlet end for receiving articles and an outlet end for advancing said articles toward a treatment section of said machine;

motor means for driving said machine;

supply means for continuously supplying said articles to said inlet end of said infeed conveyor such that an accumulation of said articles at said infeed conveyor inlet end produces a pressure head against said infeed conveyor that is related in magnitude to the number of accumulated articles, said pressure head tending to urge said infeed conveyor for translational movement against an opposing bias; and

speed control means for regulating the speed of said motor means;

said infeed conveyor including means for actuating a control element of said speed control means in accordance with translational movement of said infeed conveyor, to regulate the speed of said machine in accordance with the number of articles that have accumulated at said infeed conveyor inlet end in a manner maintaining a substantially constant number of articles accumulated.

3,952,857

MAGNETIC SUBSTANCE CONVEYING APPARATUS

Iwao Nazuka, Tokyo, Japan, assignor to Bunri Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 12, 1974, Ser. No. 496,581

Claims priority, application Japan, Mar. 22, 1974, 49-31497

Int. Cl.² B03C *1/00*

U.S. Cl. 198—41 8 Claims

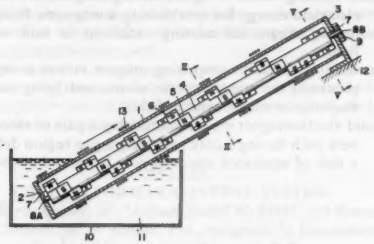
1. In a magnetic substance conveying apparatus for conveying a magnetic substance from a first position to a second position, comprising:

an inner cylinder having magnets spirally wound thereon;

an outer cylinder made of non-magnetic material and surrounding said inner cylinder over at least a portion of the length of said inner cylinder; and

means for providing relative rotational movement between said outer cylinder and said inner cylinder for conveying the magnetic substance along the outer periphery of said outer cylinder;

the improvement wherein the angle of the magnet spiral at the end portion thereof, in the vicinity of said second



position, is larger than the angle of the magnet spiral at the beginning portion thereof.

3,952,858

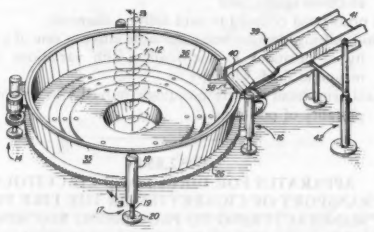
COLLECTOR AND LOADING APPARATUS FOR AUGER SPOIL

James P. Watts, 6930 E. Pinchot Ave., Scottsdale, Ariz. 85251

Filed Mar. 25, 1975, Ser. No. 561,850

Int. Cl.² B65G *29/00, 31/00, 37/00*

U.S. Cl. 198—103 9 Claims



1. In apparatus for collecting and loading auger spoil, said apparatus including:

a. a spinning annular plate supported above the ground surface about an auger hole and presenting a central opening in alignment with said hole,

b. power means for rotating said spinning plate,

c. fixed circular wall structure spaced from the periphery of said spinning plate and having a lower edge spaced from the upper surface of said spinning plate,

d. a gap in said wall structure, and

e. a conveyor belt having one end located at said gap;

the improvement consisting of:

f. means for adjusting the diameter of said opening in said spinning plate comprising an assembly of rings arranged in series and means for detachably securing adjacent rings of said assembly together in stepped relation and the outermost ring of said assembly to said spinning plate at the edge defining the central opening whereby the diameter of said opening in the spinning plate may be adjusted to substantially the diameter of a particular auger hold.

3,952,859

INTERMITTENT DRIVE FOR ROLL WRAPPER

Ronald Holt, and Paul W. Birman, Jr., both of Battle Creek, Mich., assignors to Franklin Electric Subsidiaries, Inc., Bluffton, Ind.

Filed June 6, 1975, Ser. No. 584,630

Int. Cl.² B65G *23/30*

U.S. Cl. 198—110 10 Claims

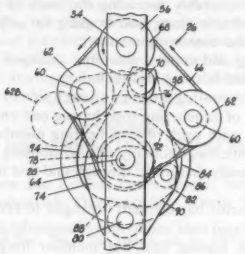
1. In combination with a wrapping machine having a wrapping conveyor and an article feed conveyor with an article

accelerating and separating conveyor disposed in article transferring relation between the first two conveyors, an intermittent drive connected to be driven in timed relation to said wrapping conveyor and to drive said accelerating conveyor, said intermittent drive comprising:

an input shaft,

an output shaft in spaced parallel relation to said input shaft,

coplanar rolls connected to said shafts to rotate therewith,



an idler roll support member mounted to move transversely of the plane of said shafts and on opposite sides of the plane of the shafts,

a pair of spaced idler rolls mounted on said support member in coplanar relation to the rolls on said shafts and on opposite sides of the plane of the shafts,

a belt loop trained around said rolls on said shafts and said idler rolls,

and cyclically operated means driven continuously by one of said shafts and connected to oscillate said support member toward and away from the plane of said shafts.

3,952,860

PLASTIC LINK FOR CONVEYOR CHAIN HAVING OPTIMAL THREE DIMENSIONAL MOBILITY

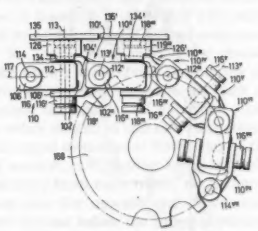
Dieter Specht, Dhunn, Germany, assignor to Interroll Fordertechnik GmbH & Co. KG, Dhunn, Germany

Filed July 30, 1974, Ser. No. 493,058

Claims priority, application Germany, Aug. 4, 1973, 2339644; June 28, 1974, 2431266

Int. Cl.² B65G *17/00*

U.S. Cl. 198—189 **17 Claims**



1. A link to be assembled to other similar links to form a chain capable of movement in three mutually perpendicular directions comprising a plastic material member of generally U-shaped configuration including a cross piece and two opposed arms, a first hub formed unitary with said cross piece and having a bore therein for receiving a first swivel axle means for pivotally securing said link to a second link, a pair of hubs respectively formed unitary with said opposed arms and having aligned bores therein for receiving a second swivel axle means for pivotally securing said link to a third link, with the longitudinal axis of said first swivel axle means being perpendicular to the longitudinal axis of said second swivel axle means, and wherein each of said pair of hubs constitutes means for attachment of supplementary parts.

3,952,861

CONVEYOR BELT SUPPORT ASSEMBLY

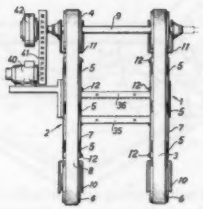
Ture Rickard Leopold Holmqvist, Dalkarrsleden 36, 162 24 Vallingby, and Adolf Gunnar Gustafson, Musseronvagen 18, 14146 Huddinge, both of Sweden

Filed June 26, 1974, Ser. No. 483,113

Claims priority, application Sweden, July 9, 1973, 7309622

Int. Cl.² B65G *15/60*

U.S. Cl. 198—204 **4 Claims**



1. In a belt conveyor having an endless belt trained around both a drive roller and idling roller journalled respectively within the arms of fork-shaped holders, the improvement comprising a tube interconnecting, spacing and alining said holders, said tube being non-round in cross section, said holders having correspondingly non-round shanks slidably fitted into the opposite ends of said tube so as to adjust the spacing of said rollers, the longitudinal axes of said tube and said shanks being substantially alined with and intersecting the axes of said rollers, and attachment means for fixing the tube and holders in adjusted position, whereby said holders, shanks and tube provide a rigid adjustable frame centered within and supporting said belt, said attachment means including screws threaded through said tube so as to bear on and force said shanks into a non-rounded corner of said tube.

3,952,862

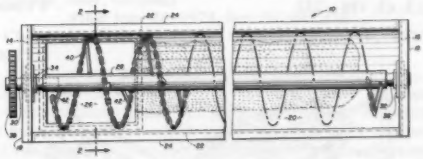
RIBBON FLIGHT CONVEYOR FORMED OF WELDED CHAIN LINKS

Franklin M. McCorkel, Leola, Pa., assignor to Aggregates Equipment, Inc., Leola, Pa.

Filed July 16, 1975, Ser. No. 596,214

Int. Cl.² B65G *33/26*

U.S. Cl. 198—213 **5 Claims**



4. Ribbon flighting for a conveyor comprising:

a mounting shaft:

a rigid spiral formed of a length of chain having adjacent links welded to each other, said rigid spiral being disposed concentrically about said mounting shaft; and

a plurality of support straps interconnecting said rigid spiral to said mounting shaft.

3,952,863
CLEANING APPARATUS FOR ENDLESS BELT INSTALLATION

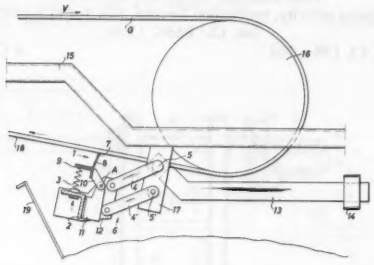
Manfred Schattauer, Ledderken 8, D 581 Witten, Germany

Filed Apr. 15, 1974, Ser. No. 460,903

Claims priority, application Germany, Apr. 18, 1973, 2319736

Int. Cl.² B65G 45/00

U.S. Cl. 198—230 **9 Claims**



1. An improved belt cleaning apparatus for cleaning the belt surface of an endless belt moving in a first direction, said belt cleaning apparatus comprising:

a scraper element having a scraping edge for contacting said belt surface to clean said belt surface,

mounting arm means upon which said scraper element is mounted, said mounting arm means being movable about an axis lying at the intersection of a first plane parallel to said belt surface and spaced therefrom a first distance and a second plane perpendicular to said belt surface and spaced a second distance upstream along said belt from said scraping edge when said scraping edge is in contact with said belt, said first distance being from two to ten times the magnitude of said second distance, whereby upon deflection of said scraper element in said first direction the movement of said scraping edge about said axis defines an arc, said mounting arm means comprising an arm pivotal about said axis and a spring having one end engaging a support fixed with respect to said mounting arm means and the other end engaging said arm, said spring urging said scraping edge into contact with said belt surface.

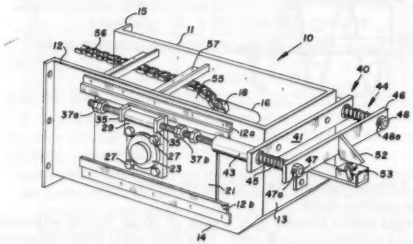
3,952,864
CONVEYOR SAFETY DEVICE

William A. Schlagel, Coon Rapids, Minn., assignor to Schlagel, Inc., Cambridge, Minn.

Filed Dec. 5, 1974, Ser. No. 529,917

Int. Cl.² B65G 43/00

U.S. Cl. 198—232 **8 Claims**



1. A detection and control unit for a continuous conveyor, which conveyor includes a supporting frame, a continuous material conveying member, a drive sprocket at one end of the conveyor and a controllable driving mechanism for driving the drive sprocket, said unit including:

a. a housing having generally upstanding sides, attachable to the supporting frame of the conveyor at a first end thereof;

b. a transversely extending shaft in said housing arranged and constructed for mounting at least one idler sprocket thereon for carrying the conveying member;

c. a pair of bearing members arranged on said sides of said housing, rotatably receiving the ends of said shaft and being shiftable along said housing for adjusting the tension on the conveying member;

d. a loading and control assembly arranged on the second end of said housing and including;

1. a first mounting member on each side of said housing;

2. a pair of connecting rods having one end thereof associated with each of said bearing members to position the same longitudinally of said housing and extending rearwardly therefrom through said first mounting members;

3. a detector bar element arranged to receive the other end of said rods and to move longitudinally therewith;

4. means biasing said bar member longitudinally outwardly of said housing and away from said first mounting members;

5. a detector cam on said detector bar element;

6. a control switch arranged for actuation by said cam for control of the controllable drive mechanism of the conveyor; and,

7. means for adjusting said connecting rods for initially shifting said transverse shaft and tension the conveying member and locating said cam with respect to said switch.

3,952,865
TRANSFER APPARATUS FOR CIGARETTES OR THE LIKE

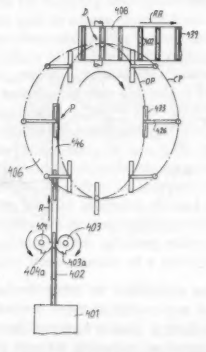
Willy Rudszinat, Dassendorf; Dieter Schwenke, Hamburg, and Werner Ringe, Geesthacht, all of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg-Bergedorf, Germany

Filed May 17, 1974, Ser. No. 470,961

Claims priority, application Germany, May 23, 1973, 2326181; July 26, 1973, 2337945

Int. Cl.² B65G 47/24

U.S. Cl. 198—240 **35 Claims**



1. Apparatus for transferring cigarettes or analogous rod-shaped articles between first and second stations where the articles respectively move lengthwise in a single file and sideways in at least one row, comprising means for feeding articles to one of said stations; article-receiving means at the other of said stations; a carrier rotatable about a predetermined axis; a pick-up device rotatable relative to said carrier about a

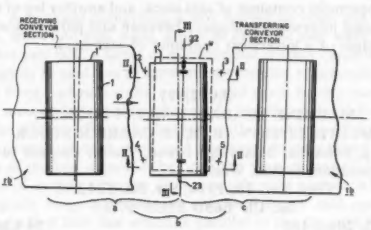
cond axis located at a fixed distance from said predetermined axis to travel past said stations along a circular path in sponse to rotation of said carrier; orienting means for rotating said device relative to said carrier while the carrier rotates thereby respectively align said device with at least one ticle at said one station and with said receiving means at said her station so that said device can pick up articles at said ie station and deliver the picked up articles to said receiving eans at said other station; and means for rotating said carrier a plurality of speeds including first and second speeds while id device respectively travels past said first and second ations, including a rotary driving member, means for norally driving said member at a constant speed, and means for iving said carrier at a plurality of speeds in response to tation of said driving member at said predetermined speed.

3,952,866

EVICE FOR DIRECTING STRIPS OF THERMOPLASTIC MATERIAL

rnoldus Willem Jan Leloux, Dedemsvaart, Netherlands, assignor to Industriele Onderneming Wavin N.V., Zwolle, Netherlands

ontinuation of Ser. No. 176,349, Sept. 8, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,544
Claims priority, application Netherlands, Sept. 8, 1970, 013280
Int. Cl.² B65G 47/24
.S. Cl. 198—262 6 Claims



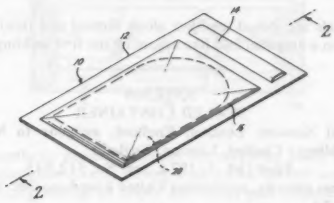
1. A device for directing strips of translucent thermoplastic aterial, particularly cut pieces of thermoplastic foil for producing bags in which each piece has front, rear and side edges nd the pieces are adapted to be supplied to a sealing means, ıcluding a conveyor section receiving cut pieces, a positionıg section downstream of the conveyor section and in which ıe position of the strips is corrected with respect to the main irection of movement, and a second conveyor section downream of the positioning section for transferring the cut ieces to the sealing means, said positioning section comprisıg two pairs of needles located in the path of movement of ıe cut pieces, the needles of each pair being located one ehind the other viewed in the main direction of conveyance nd being at equal distances at both sides of the center of the ositioning section, said needles being capable of movement ɔward and away from each other, means mounting the neeles of each pair for upward and downward movement, a riven roller located below the plane of movement of the cut ieces in line with each pair of needles, a separate drive operaly related to the needles of each pair for moving the needles elative to each other and for driving the driven roller assoiated with such pair, the needles of each pair having switch ıeans for activating and deactivating the drive, the arrangeıent being such that when a strip is arrested at the positioning ection, the needles move downwardly and the drives actiated for moving the needles of each pair toward each other, nd if the piece is in a skew position, the needle of one pair djacent the rear edge and the needle of the other pair adjaent the front edge will make contact with the piece whereby he driven roller will be rotated to move the piece at the same ate as said one needle and in the same direction, and upon the piece making contact with the other needle of said one pair, the switch means of said one pair deactivates the drive thus stopping the driven roller and arresting the movement of the needles of said one pair, and further means operably related to the side edges of the piece for correcting the position of the piece in a tranverse direction.

3,952,867

DISPOSABLE TOOTH CLEANING APPARATUS

William F. McCord, 1026 Shorewood Drive, Seabrook, Tex. 77586

Filed Mar. 19, 1975, Ser. No. 560,016
Int. Cl.² B65D 35/22, 85/00
U.S. Cl. 206—229 2 Claims



1. A disposable tooth cleaning apparatus comprising,
a sealed package having first and second separate compartments,
the first compartment includes ingestible non-foaming toothpaste,
the second compartment includes an applicator having an opening and sized and shaped for insertion over the index finger,
said applicator having an outer layer including a soft absorbent non-woven fabric for supporting the toothpaste and moisture, said fabric being interwoven with reenforcing fibers for supporting the fabric and providing a non-smooth surface for cleaning the teeth,
said applicator having an inner layer of plastic bonded to the outer layer for providing a support backing to the outer layer and for keeping the finger dry, and
the edges of the applicator being joined together by heat sealing the outer edge of the inner layer together.

3,952,868

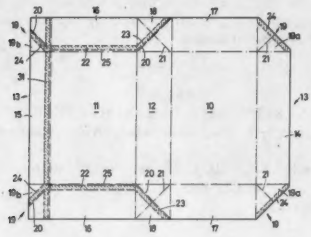
CIGARETTE PACKET OF LAMINATED SHEETING AND METHOD FOR THE PRODUCTION THEREOF

Dietrich Müller; Hans-Jürgen Blichenberg, both of Hamburg; Dieter Schmidt, Halstenbek; Heinz Focke, and Kurt Liedtke, both of Verden, all of Germany, assignors to Focke & Pfuhl, Verden, Aller, Germany

Filed June 20, 1974, Ser. No. 481,418
Claims priority, application Germany, June 20, 1973, 2331335
Int. Cl.² B65D 65/02, 75/20, 75/26, 85/10
U.S. Cl. 206—273 4 Claims

1. In a cigarette packet of a laminated sheeting comprising an outer, thermally bondable layer, wherein a blank encloses the contents of the pack in a tubular manner and end flaps are provided which are joined to each other and project beyond the end sides, said end flaps being folded such that an inner longitudinal end flap bears on the packet contents, two side end flaps being folded on this longitudinal end flap and the second outer longitudinal end flap on the side end flaps and the first inner longitudinal end flaps, the improvement characterized in that the outer longitudinal end flap of the laminated foil comprises on both sides an outer thermally bondable layer which extends over the entire end face and along an edge turned towards the packet edge of the inner longitudinal end

flap, a first activated bondable welding strip extending the length of the end face, and said side end flaps folded at their



diagonals are joined together along second and third welding strips on a diagonal fold line adjoining the first welding strip.

3,952,869

SEALED CONTAINER

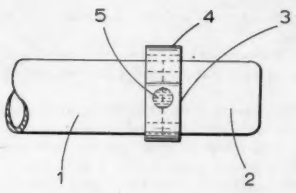
Michael Sansom, London, England, assignor to Matburn (Holdings) Limited, London, England

Filed Oct. 7, 1974, Ser. No. 512,843

Claims priority, application United Kingdom, Oct. 11, 1973, 47519/73

Int. Cl.² B65D *17/20, 77/30*

U.S. Cl. 206—363 **1 Claim**



1. A container for surgical instruments or other articles comprising a body, a cap fitted to the body and closing an end thereof, a sealing band of self-adhesive thermoplastic material spanning the area at which the cap and body abut, the band being wound about the periphery of the body and cap for at least two complete convolutions, which windings seal the cap and the body together in a sterile manner, and a welded sealing area formed by welding together into integral relationship overlying portions of the convolutions of the band whereby a visible blemished area is produced either in the outermost convolution or in the convolution adjacent thereto and underlying same when the seal at the welded area is broken.

3,952,870

CONTAINER FOR DENTAL INSTRUMENTS

Marcel Garnier, Besancon, France, assignor to Micro-Mega, France

Division of Ser. No. 422,190, Dec. 6, 1973, abandoned. This application July 8, 1975, Ser. No. 593,956

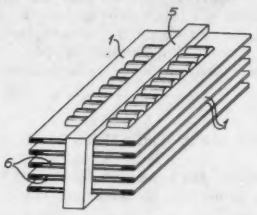
Claims priority, application France, Dec. 19, 1972, 72.45279

Int. Cl.² A61C *19/02*

U.S. Cl. 206—369 **5 Claims**

1. In combination:

a. a plurality of containers for dental instruments each having a covered side and an opposite side, said plurality of containers being stacked in pairs having the covered sides of the containers in said pairs opposed to each other, each of said containers comprising a thin plate having a first and second major surface and a pair of opposed longitudinal edges, said first major surface corresponding to the covered side being provided with a plurality of pairs of opposed recesses connected by a channel therebetween disposed in two parallel rows for receiving dental instruments therein, and said second major surface having a plurality of pairs of opposed bulges disposed in two parallel rows with a space defined therebetween, said bulges corresponding to said recesses in said first major surface, a cover disposed on said first major surface for



covering said recesses to protect dental instruments contained therein and to hold them in the container, and means for securing said cover to said thin plate; and

b. a substantially U-shaped clamp having two legs engaging said stack of containers with a leg of said clamp inserted in said space between said parallel rows of bulges of an uppermost container of said stack, and another leg of said clamp inserted in said space between said parallel rows of bulges of a lowermost container of said stack.

3,952,871

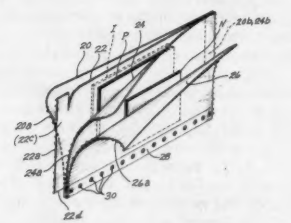
MACHINE LOADABLE MULTI-POCKET, MULTI-SECTION ARTICLE CARRIER STOCK

Arlen J. Erickson, Bainbridge Island, Wash., assignor to CX Corporation, Seattle, Wash.

Filed Nov. 18, 1974, Ser. No. 524,398

Int. Cl.² B65D *85/30, 27/10*

U.S. Cl. 206—455 **14 Claims**



1. In mechanical packaging of sheet articles and the like, elongated multi-leaf packaging carrier stock having flexible leaves joined together along one longitudinal edge and free to be spread apart at their opposite edge for insertion of articles transversely between the leaves at an insertion station and thereafter reclosed in timed relation with longitudinal advancement of the stock, said stock comprising mutually superimposed first and second leaves and a third leaf interposed therebetween, the leaves having corresponding sets of transverse score lines at interval locations spaced lengthwise of the stock defining lines of severance of successive carrier length sections when torn from the stock at such locations, the first and second leaves at each such interval location having mutually opposed patches of contact adhesive applied thereto adjacent their respective score lines, the third leaf, separating such adhesive patches with the relatively adjoining carrier-length sections unsevered, having its transverse score lines

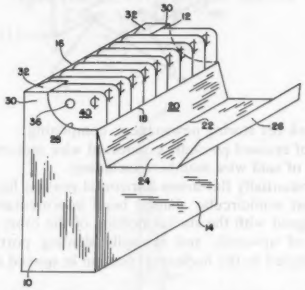
offset from the correspondingly related score lines of the first and third leaves so as to withdraw a portion of the third leaf from between such contact adhesive patches when the relatively adjoining sections are severed and the leaves parted at the intervening associated score lines.

3,952,872

PACKAGE FOR CARDED MERCHANDISE

Peter A. Consiglio, Jr., c/o Parker Metal Corp., 85 Prescott St., Worcester, Mass. 01601

Filed Nov. 18, 1974, Ser. No. 524,496
Int. Cl.² B65D 5/66, 85/54
U.S. Cl. 206—526 2 Claims



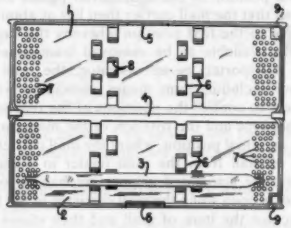
1. A package comprising a box having an open top, a bottom, front and rear walls, a pair of opposite side walls, and a lid for said box, a series of merchandise display cards stacked uprightly in said box in substantially parallel relationship with said front and rear walls, each of said cards having merchandise mounted thereon and being of a length substantially equal to the distance from the bottom to the open top of said box, an aperture in each card, said apertures being aligned at the area of the box adjacent the open top thereof, one of the side walls of said box having an upper side wall portion which is integrally hinged to said one side wall below said open top along a first fold line which is parallel to the top and bottom of said box, said lid including said upper side wall portion, a top member hinged to the top edge of said upper side wall portion along a second fold line parallel to said first fold line for closing said open top, and an end flap hinged to said top member along a third fold line parallel to said second fold line and opposite said upper wall portion, for securing said lid in closed position, said front and rear walls each having an opening therein extending downwardly from said open top and inwardly from said one side wall, said openings providing a corner recess in said front and rear walls adjacent said one side wall which is of a depth along said one side wall substantially equal to the depth of said upper side wall portion between said first and second fold lines and is of a width adjacent said open top sufficient to expose the apertures in said cards, solid portions on each of said front and rear walls along the side of said openings which is opposite said one side wall, said solid portions extending upwardly to said open top and providing support for said top member of said lid in its closed position, said lid being swingable about said first hinge line to close said box by raising said upper side wall portion into substantially the same plane with the remainder of said one side wall, swinging said top member down about said second fold line over said open top and folding said end flap down in adjacent parallel relationship with said side wall opposite said one side wall, said openings when the lid is closed exposing the aligned apertures in said series of cards whereby a hanger rod for said cards may be inserted through said openings and the aligned apertures, said lid alternatively being swingable about said first hinge line to swing the lid outwardly and down below said first hinge line whereby aligned like corners of all of the cards are fully exposed for the application of price markings thereon.

3,952,873

CONTAINER FOR TUBULAR GLASS EQUIPMENT

Klaus Pampuch, Neubrucker Str. 40, 1 Berlin 28, and Gunter Wanke, Suderoder Str. 30, 1 Berlin 47, both of Germany

Filed Oct. 31, 1974, Ser. No. 519,397
Claims priority, application Germany, Nov. 23, 1973, 2359041
Int. Cl.² B65D 83/02, 85/20, 85/42
U.S. Cl. 206—528 7 Claims



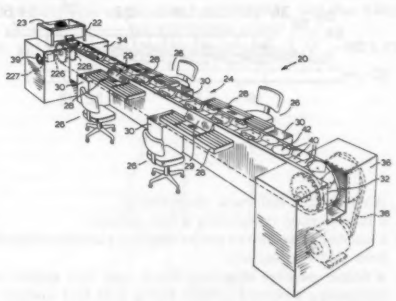
1. A synthetic plastic container for receiving easily breakable tubular glass articles having sealed ends therein comprising a housing having an upper and lower part connected by hinge strip means along one side, a snap closure means along the other side of said upper and lower parts, holding clips extending from at least one of said upper and lower parts for holding said tubular glass articles therein and having groups of spaced pins arranged in a brushwise manner extending inwardly from said housing at opposing ends of at least one of said parts and located at zones where the sealed ends of said glass articles are reduced and sensitive.

3,952,874

MAIL PROCESSING EQUIPMENT

Trevor Wynne Owen, Mississauga, Canada, assignor to Owen Tri-Cut Limited, Mississauga, Canada

Filed Jan. 8, 1975, Ser. No. 539,489
Int. Cl.² B65G 47/24
U.S. Cl. 209—73 6 Claims



1. Mail processing equipment for use in receiving open items of mail and for presenting such items to operators positioned at either side of the mail processing equipment, the equipment comprising:

a mail feeder adapted to feed items of mail individually; and

a mail transporter located adjacent the mail feeder for receiving individual items of mail from the feeder, the mail transporter including a closed loop conveyor means following a path having a top part extending from the mail feeder past the operators, individual mail carriers carried by the conveyor means, each of the mail carriers having a gripper mechanism operable to move between a closed

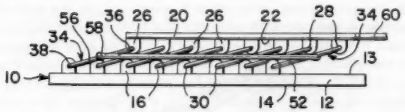
position for holding an item of mail when the item of mail is in portions of said path not serviced directly by the operators, and an open position where this item of mail rests on the mail carrier as the carrier passes along at least a portion of said top part and is available for removal from the mail carrier by at least one of the operators, and rotation mechanisms coupling the respective mail carriers to the conveyor means and operable to rotate each of the mail carriers between a first position for receiving an item of mail moving longitudinally from the mail feeder and a second position as the mail carrier passes along said top part so that the mail carrier then lies at about 90 degrees relative to the first position whereby the item of mail is readily available to be removed transversely from the mail transporter by an operator, the mail transporter further including cam means associated with the mail carriers to control the positions of the respective gripper mechanisms and the rotation of the mail carriers so that from an initial position, where the mail carrier receives an item of mail from the mail feeder in passing the mail feeder, the associated gripper mechanism on each mail carrier is open when the mail carrier is in the first position to receive the item of mail and then closes as the mail carrier moves from the first to the second position before again opening with the mail carrier in the second position to carry the item of mail past the operators for removal by one of the operators, the cam means then causing the gripper mechanism to close and the mail carrier to return to the first position before carrying any remaining item of mail back to said initial position.

3,952,875

DISH DRAINER

Virginia Lombardo, Valley Stream, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Dec. 23, 1974, Ser. No. 535,374
Int. Cl.² A47G *19/08*
U.S. Cl. 211—41 **8 Claims**



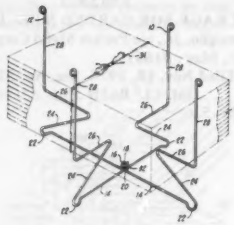
1. A collapsible dish rack, comprising:
a. a base portion comprising a first surface;
b. a number of apertured projecting first elements extending from said first surface;
c. a frame member disposed above said first surface and comprising a second surface facing said first surface;
d. a number of apertured projecting second elements extending from said second surface
e. intermediate linking elements disposed between said first and second projecting elements, said linking elements individually comprising a first end portion pivotally disposed in an associated aperture of a said first projecting element and a second end portion pivotally disposed in an associated aperture of a said second projecting element;
f. a detente portion located at at least one of said first and second projecting elements so as to engage the linking element associated therewith; and
g. a rod element pivotally disposed at central parts of said linking elements.

3,952,876

STORAGE RACK FOR PAPERS

David D. Price, 1435 Duffner, Oklahoma City, Okla. 73118

Filed Aug. 14, 1974, Ser. No. 497,181
Int. Cl.² A47F *7/00*; A47G *23/02*
U.S. Cl. 211—50 **1 Claim**



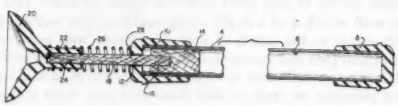
1. A rack for storing newspapers, comprising:
a pair of crossed pivotally connected wire members, each of said wire members including:
a substantially flat lower horizontal portion having an at least semicircular shaped bend intermediate its ends aligned with the similar portion of the other member;
a pair of upwardly and inwardly slanting portions each connected to the horizontal portion in spaced apart relation;
an upper horizontal portion extending outwardly from the upper end of each slanting portion;
an upper vertically extending portion; and
means pivotally connecting said semicircular shaped bend portions, said pivotally connecting means including:
an apertured clam shell-shaped retainer partially enclosing the upper bend;
an apertured clam shell-shaped retainer partially enclosing the lower bend; and
a bolt fastener extending though the bends and the retainers holding the retainers and bends in assembled relation.

3,952,877

HANGER ROD HAVING SPRING LOADED SUCTION CUP

George F. Kindl, Newington, Conn., assignor to Loc-Rite, Incorporated, Newington, Conn.

Filed Apr. 23, 1975, Ser. No. 570,662
Int. Cl.² A47H *1/08*
U.S. Cl. 211—105.5 **2 Claims**



1. A hanger rod adapted to be inserted between two parallel surfaces comprising:
a rod having a hollow interior portion defining a cylindrical wall;
means mounted upon one end of the rod for engaging one of the surfaces;
a suction cup, having a hub portion with a cavity therein, located adjacent the other end of the rod, the suction cup being adapted for compressive engagement with the other surface;
a first dowel mounted within the hollow portion for axial sliding movement over the wall thereof;
a second dowel having one end thereof received in the cavity in the hub portion of the suction cup and the other end thereof fixedly connected to the first dowel;

a spring in contact with the suction cup interposed between the suction cup and the second mentioned end of the rod to urge the suction cup away from the rod, the spring being coiled about the hub portion of the suction cup so as to exert a radially inward force on the hub portion which secures the second dowel thereto; and

means to provide a seat for the spring at the second mentioned end of the rod.

3,952,878

GUN STAND

Jack R. Gorham, 3966 Lugo Ave., Lynwood, Calif. 90262

Filed Feb. 18, 1975, Ser. No. 550,758

Int. Cl.² A47F *7/00*

U.S. Cl. 211—64 **6 Claims**

1. A folding collapsible earth engaging gun rack comprising an elongate vertical plate with front and rear surfaces and having a central elongate, vertical, earth engaging lower spike portion of limited lateral extent with a downwardly convergent pointed lower end, laterally spaced laterally outwardly and rearwardly projecting horizontal flanges with lower earth engaging surfaces and upper foot engaging surface at the upper end and at opposite sides of the spike portion and laterally outwardly projecting flat vertical hinge plates in vertical spaced relationship above the flanges, laterally spaced elongate normally horizontally disposed forwardly projecting gun butt receiving trays with inner and outer ends and normally vertical hinge plates at their rear ends with upper edges pivotally connected with upper edges of related hinge plates of said plate and normally establishing flat, stopped bearing engagement on the said related hinge plates, said trays being pivotally shiftable upwardly rearwardly and downwardly to a folded vertical position at the rear of the plate with their outer ends adjacent to and opposing said flanges related thereto, an elongate vertically extending column having an elongate outer upwardly opening lower tube section substantially coextensive with and fixed to and extending longitudinally of the central vertical axis of the plate, an elongate vertical inner tube section telescopically engaged in the outer tube and normally projecting upwardly therefrom, a yoke at the upper end of the inner tube and defining laterally spaced laterally outwardly projecting vertically and forwardly opening gun barrel engaging hooks normally spaced above and rearward of the trays, and releasable lock means between said tube sections, said inner tube sections being shiftable downwardly to a collapsed position within the outer section where said hooks engage the hinge plates of the trays when said trays are in said folded position.

3,952,879

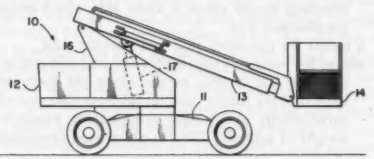
OVERLOAD CONTROL FOR LIFTING BOOM

John L. Grove, Greencastle, Pa., assignor to Fulton Industries, Inc., McConnellsburg, Pa.

Filed Feb. 14, 1975, Ser. No. 550,073

Int. Cl.² B66C *13/48*

U.S. Cl. 212—39 MS **19 Claims**



1. In a machine having a movable boom for lifting a load, the boom being thereby subjected to bending stresses which strain the boom,

a beam extending along and generally parallel to a side of said boom;

means securing one end only of said beam to the side of said boom for twisting of said one end of said beam upon the imposition of bending stresses on said boom, said securing means comprising a pair of spaced anchor means vertically spaced when the boom axis is horizontal secured to said boom side and being spaced apart a substantially greater distance than the depth required for a beam in order to prevent significant deflection thereof,

and means spaced from said anchor means for sensing movement of said beam relative to said boom as said boom is stressed toward an overload condition,

whereby the movement of said beam relative to said boom is enhanced by the twisting of said end thereof to provide greater sensitivity of measurement of boom strain.

3,952,880

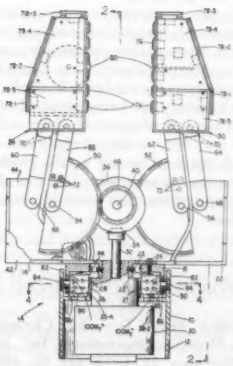
FORCE AND TORQUE SENSING METHOD AND MEANS FOR MANIPULATORS AND THE LIKE

John W. Hill, Palo Alto, and Antony J. Sword, San Francisco, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Division of Ser. No. 406,553, Oct. 15, 1973, Pat. No. 3,921,445. This application Jan. 28, 1975, Ser. No. 544,695

Int. Cl.² B25B *11/00*

U.S. Cl. 214—1 CM **1 Claim**



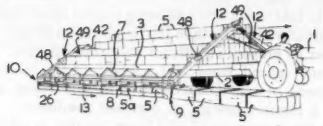
1. A manipulator comprising:

a motor operated end effector;
end effector supporting means;
means coupling said end effector and end effector supporting means along a longitudinal axis extending therethrough;
sensing means connected between said end effector and end effector supporting means for sensing at least one component of torque transmitted therebetween through said coupling means about a cross axis which intersects the longitudinal axis;
a motor for operating said end effector; and
means for mounting said motor and end effector at opposite sides of said sensing means along the longitudinal axis such that the motor counterbalances said end effector to substantially null torque components produced by the weight of said end effector about said cross axis.

3,952,881
BALE LOADER

LeRoy Andrew Knudson, P.O. Box 3, Consort, Alberta, Canada

Filed Aug. 14, 1974, Ser. No. 497,350
Claims priority, application Canada, May 22, 1974, 200520
Int. Cl.² A01D *87/12*; **B65G** *57/32*
U.S. Cl. 214—6 B **8 Claims**



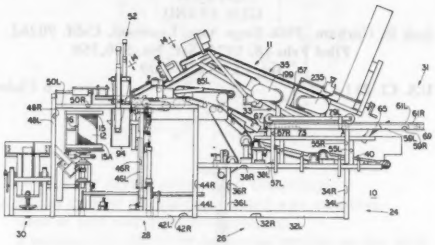
1. A bale loader adapted to be secured to a mobile platform on which bales are to be loaded, comprising:
a. an elongated suspended mechanical grab assembly including depending, pivoted jaws defining the sides of the assembly, said assembly having a front end and a rear end generally coincident with front and rear ends of said platform, respectively;
b. grab lifting means supported by said platform;
c. said grab lifting means being secured to said grab assembly so as to suspend same, and being arranged to lift said grab assembly from a load engagement position wherein said grab assembly extends along one side of said platform a short distance above the ground, to a load release position in which the jaws release the load to deposit same on said platform;
d. locking means operatively connected to said grab assembly for releasably maintaining said jaws in open position;
e. a movable feeler means operatively connected with the locking means to release same upon actuation of the feeler; said feeler means being located at the rear end of the grab assembly and being actuated by horizontal relative movement thereagainst of a bale as the grab assembly with the jaws open is moved along and over at least one bale, with the bale resting on the ground and being located between the jaws, when said end of the bale reaches said rear end of the grab assembly to actuate said movable feeler.

3,952,882
DEVICE FOR DELIVERING PADS TO A BUNDLING MACHINE

Edwin A. Molitor, Miami Township, Clermont County, Ohio, assignor to Multifold-International, Inc., Milford, Ohio

Filed Aug. 21, 1974, Ser. No. 499,180
Int. Cl.² B65G *60/00*
U.S. Cl. 214—6 D **7 Claims**

7. A device for delivering pads to a machine for bundling flat articles which comprises a pad hopper, means for guiding a conveyor belt under the pad hopper, the conveyor belt supporting a stack of pads in the pad hopper, means for delivering pads into the pad hopper on top of the stack of pads therein, means for stopping pads on the stack as they are delivered into the pad hopper, a discriminator having a lower edge terminating spaced above the conveyor belt a sufficient distance to permit a pad to pass thereunder, means for arresting the pad delivering means when the stack of pads reaches a predetermined height, means for advancing the conveyor

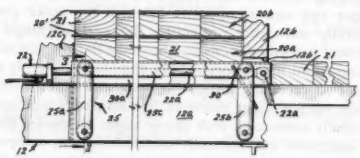


belt to advance the lowermost pad in the stack under the discriminator, a switch actuator in the path of the lowermost pad, means controlled by the switch actuator for arresting advance of the conveyor belt when the lowermost pad has been advanced to a predetermined position in engagement with the switch actuator, and means for removing the lowermost pad when required, the switch actuator returning to a position at which the conveyor belt is advanced when the switch actuator is released.

3,952,883
AUTOMATIC MATERIAL FEEDING APPARATUS

Stewart A. Phillips, 1404 Continental Drive, Evansville, Ind. 47715

Filed Feb. 20, 1974, Ser. No. 444,105
Int. Cl.² B65G *59/06*
U.S. Cl. 214—8.5 K **6 Claims**



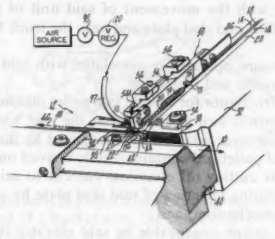
1. Apparatus for automatically feeding a material comprising a framework including support members, multi-layers of material on said support members, means movable from a non-ejecting position to a position ejecting one of said layers of material from said apparatus, and means including a portion of a linkage assembly maintaining layers of material above said one of said layers after withdrawal of said ejecting means upon reaching an ejecting position to said non-ejecting position and permitting the dropping of the next succeeding layer of material into an ejecting position, said linkage assembly having a first movable component, a second movable component, a third movable component and a fourth stationary component in a parallelogram relationship, and where said second movable component is said portion of said maintaining means.

3,952,884

APPARATUS FOR FEEDING HEADED WORK BLANKS

Chester Thomas Babiarz, Windsor Locks, Conn., assignor to The Hartford Special Machinery Company, Simsbury, Conn.

Filed Feb. 26, 1975, Ser. No. 553,243
Int. Cl.² B65G *53/00*
U.S. Cl. 214—8.5 E 10 Claims



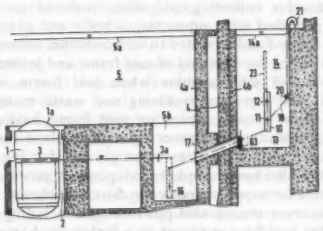
1. For use in feeding work blanks to an entrance of a work station wherein the work blanks each have a shank and a head of enlarged diameter relative to the shank, an apparatus comprising a pair of spaced feed rails defining a track leading to the entrance of the work station, the feed rails having a discharge end, the work station entrance being located in adjacent downstream relation to the discharge end of the feed rails, the feed rails and the work station respectively having a pair of work blank supporting surfaces spaced apart for supporting heads of the work blanks being handled, a track cover in overlying spaced relation to the feed rails, the track cover having an end projecting beyond the discharge end of the feed rails, an air ejection orifice formed in said end of the track cover in overlying relation to the entrance of the work station, and passage means including an air supply line connected to the orifice for directing air under pressure from the orifice onto the top of each work blank upon its discharge from the feed rails to positively seat the work blank head on the supporting surfaces at the entrance of the work station.

3,952,885

NUCLEAR REACTOR INSTALLATION

Hans-Peter Schabert, Erlangen; Robert Weber, Uttenreuth, and Artur Bauer, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 25, 1974, Ser. No. 491,663
Claims priority, application Germany, July 27, 1973, 2338228
Int. Cl.² G21C *19/20*
U.S. Cl. 214—18 N 2 Claims



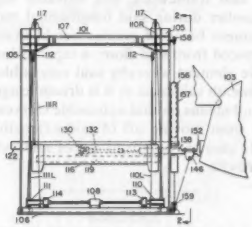
1. A nuclear reactor installation comprising a containment forming an upstanding wall having opposite sides, a fuel element transfer tube having opposite ends and extending transversely through said wall, said ends respectively opening on said opposite sides of said wall, an elongated fuel element carrier, guide means for guiding said carrier to travel endwise through said tube, said tube being positioned at an angle from horizontal so that one of said ends is a higher end and the other of said ends is a lower end, said angle being sufficient to cause gravity to move said carrier in a downhill direction while guided by said guide means, a flexible cable connected to said carrier, means for applying tension to said cable to pull said carrier uphill while guided by said guide means, said containment forming a fuel element handling pit on the said side of said wall to which said tube's said upper ends opens, said pit being water-flooded, said cable being directed to pull said carrier at said angle of said tube into said pit from said upper end of said tube, and means in said pit for turning said carrier from said angle to a vertical position, said pit having a vertical passage extending downwardly far enough to at least substantially completely receive a fuel element carried by said carrier.

3,952,886

ARRANGEMENT FOR STABILIZING AN AIRCRAFT DURING LOADING AND UNLOADING OPERATIONS

Edis Hazne, 9000 Pleasantview Drive, Northfield, Ohio 44067

Filed Mar. 10, 1975, Ser. No. 557,148
Int. Cl.² B65G *67/00*
U.S. Cl. 214—38 BA 6 Claims



1. An arrangement for use with aircraft having a nose opening through which cargo can be loaded and unloaded, said arrangement being operable to suspend a stabilizing weight from a hook mounted in the nose opening of each such aircraft, including,

conveying equipment for transferring cargo through the nose opening of an aircraft appropriately positioned adjacent one end of said conveying equipment;

hoisting means for raising and lowering said conveying equipment;

a support bar having an upwardly disposed hook formed in one end, said support bar being mounted for longitudinal movement on said conveying equipment with its hooked end being disposed at said one end thereof;

motive means mounted on said conveying equipment and connected to said support bar said motive means being capable of extending said support bar beyond said one end of said conveying equipment;

a transfer member having a first end releasably engageable with the hook of said support and a second end releasably engageable with the hook on an aircraft appropriately positioned as aforesaid; and

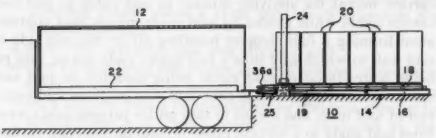
means suspending said stabilizing weight from said transfer member, whereby upon an aircraft being appropriately positioned as aforesaid and upon said stabilizing weight being suspended from said one end of said transfer member, said weight can be suspended from the hook on said aircraft by raising said conveying equipment and extending said support bar until said second end of said transfer member is suitably positioned above the hook on said aircraft and by lowering said conveying equipment until said second end of said transfer member engages the hook on said aircraft and said first end of said transfer member is released from the hook on said support bar.

3,952,887

VEHICLE LOADING AND UNLOADING APPARATUS

David Edward Lutz, 330 Washington Lane, Carlisle, Pa. 17013

Filed Apr. 16, 1974, Ser. No. 461,467
Int. Cl.[2] B65G 67/02
U.S. Cl. 214—38 C 14 Claims



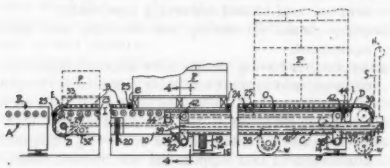
1. Apparatus mounted on a loading dock for loading and unloading from vehicles loads supported in spaced relationship to the floor of the vehicle comprising an elongated base mounted on said dock, an elongated extensible element mounted on said base for movement in a longitudinal path relative to said base and into and out of a vehicle to be loaded or unloaded, reversible drive means operably connected to said base and said extensible element to effect said movement, said extensible element comprising a framework, load supporting rollers journaled in said framework, second rollers journaled in said framework and movably supporting said extensible member during said longitudinal movement, said extensible element being of greater height than the distance said load is spaced from said floor, a tapered leading edge on said extensible element whereby said extensible element can be wedged beneath said load as it is driven longitudinally into the vehicle, and means on said extensible element for preventing said load from moving off of said extensible element as said extensible element is moved out of said vehicle carrying said load therewith.

3,952,888

DISCHARGE CONVEYOR FOR TRANSFERRING PALLETIZED CARTONS ONTO A TRUCK, CART AND THE LIKE

Richard W. Currie, Saratoga, Calif., assignor to Currie Machinery Company, Santa Clara, Calif.

Filed Aug. 2, 1974, Ser. No. 494,090
Int. Cl.[2] B65G 67/04
U.S. Cl. 214—41 R 6 Claims



1. A discharge conveyor for receiving palletized cartons at a predetermined level at one end for discharge at its opposite end and at a lower level onto the top surface of the truck bed of a cart and the like without tilting of such palletized cartons, comprising in combination:

a. a frame;

b. a roller conveyor at the receiving end of said frame for receiving and supporting a unit of palletized cartons at said predetermined level;

c. pallet moving means supported on the side walls of said frame for engaging each unit of palletized cartons arriving on said roller conveyor for moving said pallet of cartons toward the opposite end of said conveyor;

d. a skid plate at the opposite end of said conveyor;

e. an elevator-lift mechanism on the side walls of said frame and below said skid plate for normally supporting the latter at said predetermined level for receiving a unit of palletized cartons therefrom;

f. a tunnel-like space below said skid plate for receiving the truck bed of a cart disposed therebelow;

g. a cart having a flat truck bed for supporting said skid plate thereon and means on the top surface of the truck bed of such cart engageable by the pallet of a unit of palletized cartons discharging from said conveyor for simultaneously moving the cart from below said skid plate in unison with the movement of said unit of palletized cartons off of said skid plate and onto the truck bed of the cart; and

h. control means operatively associated with said elevator-lift mechanism and including:

1. an electric motor for driving said pallet moving means;

2. an electrical switch disposed at the mid zone of said roller conveyor adapted to be engaged by the pallet of a unit of palletized containers fully arrived on said skid plate for cutting off electrical current to said electric motor during lowering of said skid plate by said elevator-lift mechanism; and

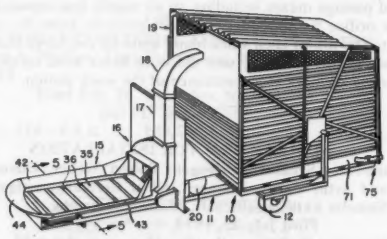
3. a limit switch engageable by said elevator-lift mechanism as it arrives at its lowered condition for re-establishing electrical current to said electrical motor for driving said pallet moving means to move the pallet on said skid plate further toward the discharge end of said conveyor and onto the flat bed of said cart.

3,952,889

APPARATUS FOR COLLECTING COMBINE WASTE

William C. Wanker, Culver; James J. Quinn, and Fred E. Kirby, both of Madras, all of Oreg., assignors to Foster Manufacturing Company, Inc., Madras, Oreg.

Filed Nov. 18, 1974, Ser. No. 524,781
Int. Cl.[2] B65G 67/22
U.S. Cl. 214—42 R 8 Claims



1. In combination with a combine having a rearwardly extending hood located above the ground and discharging waste material downwardly under gravity from said hood, apparatus for collecting said waste material comprising: a frame provided with supporting wheels and extending forwardly thereof and mounted to said combine; conveyor means carried by the forward end of said frame and located beneath said hood of said combine when said frame is attached thereto, said conveyor receiving said waste material under gravity flow; blower means on said frame having an inlet opening extending in a generally vertical plane for receiving material from said conveyor means and forcing the same through a discharge conduit; independent power means on said frame for supplying power to drive said blower means and said conveyor means; said power means including means for operating said blower means at a higher discharge rate than the delivery rate of said conveyor means to prevent accumulation of material received from said combine adjacent the inlet opening of said blower means; and collection bin means mounted on the rear of said frame above said wheels for collecting material forced through said discharge conduit.

3,952,890
HYDRAULICALLY OPERATED SHOVELS

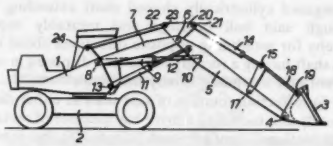
Anthony Clubley Armstrong, Abergavenny, Wales, assignor to Hy-Mac Limited, Wales

Filed Mar. 6, 1975, Ser. No. 556,187

Claims priority, application United Kingdom, Mar. 12, 1974, 10876/74

Int. Cl.² E02F *3/32*

U.S. Cl. 214—138 R **12 Claims**



1. A hydraulically operated shovel having a bucket mounted at one end of a bucket arm, the other end of which is pivotally mounted on a main arm shorter than the bucket arm, the main arm being mounted on a pivot on a chassis member, a luffing ram or rams acting on the bucket arm, and a lifting ram or rams acting between an intermediate point on the bucket arm and a point on the chassis member spaced from the mounting point thereon of the main arm in such a way that the lifting ram or rams cannot lie in the same straight line as the part of the bucket arm between the pivot of the bucket arm on the main arm and the intermediate point, and also that the bucket can be caused to describe a substantiallyl straight line movement in a predetermined direction under the influence of the luffing ram or rams with the lifting ram or rams maintained at a constant length.

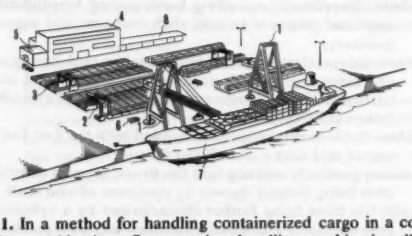
3,952,891
METHOD OF CONTAINERS HANDLING IN CONTAINER YARDS

Susumu Terayama, Okayama, and Noriyoshi Mameda, Tamano, both of Japan, assignors to Mitsui Shipbuilding & Engineering Co., Ltd., Tokyo, Japan

Filed Feb. 27, 1974, Ser. No. 446,295

Int. Cl.² B65G *63/00*

U.S. Cl. 214—152 **4 Claims**



1. In a method for handling containerized cargo in a container yard having a first container handling machine installed in the transferring area of said container yard, a second container handling machine operating in said yard, a plurality of wheeled transport vehicles for transporting the containers within the container yard, each of said container handling machines having controllable display means controllable from a control center, and a control center having computer means for receiving and storing input and output information concerning both the containers being processed by the yard and transport vehicles operating in the yard for commanding and supervising the loading, storing and unloading operations of said first and second container handling machines and of said transport vehicles; the improved method of handling containers in said container yard comprising the steps of providing a corresponding unique container yard assigned sequence number to each container by said control center and suitably labeling the container with the number, said number being stored in the control center and effective for use only while the container is in said container yard, assigning and applying a predetermined and different vehicle number to each transport vehicle operating within the container yard by said control center, said predetermined vehicle number being stored and used by the control center only while the transport vehicle is within said container yard, and displaying said container number and said vehicle number by said controllable display means mounted on said first and second container handling machines substantially simultaneously in point of time in accordance with an operation command from said control center during each handling operation, thereby enabling the operators of said container handling machines and said transport vehicles to mutually confirm the handling operation command from said control center for each container by utilizing said centrally controlled and substantially simultaneously displayed container number and vehicle number as a common key word.

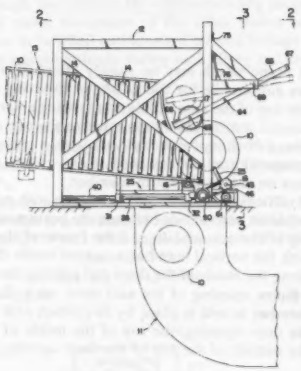
3,952,892
APPARATUS FOR HANDLING AND SPINNING TIRES AT A TRIMMING STATION

Jack Randall Robinson, Cuyahoga Falls, and Roger T. Hilton, Akron, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 27, 1975, Ser. No. 562,389

Int. Cl.² B65G *7/04*

U.S. Cl. 214—340 **9 Claims**



1. In a post-cure tire processing apparatus for sequentially receiving and discharging tires of various dimensions and for spinning a received tire about its axis of rotation to facilitate trimming therefrom vents, mold flash and the like, the improvement which comprises:

at least three parallel rollers adapted to engage at spaced circumferential locations, the tread portion of and rotatably locate therebetween a tire for spinning about its axis of rotation, said rollers including:

a drive roller and variable speed drive means therefore for spinning said tire,

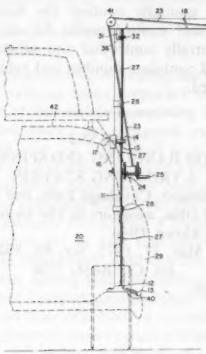
a movably mounted retaining roller adapted to apply retaining pressure to said tire, and

a retractable roller adapted to be shifted between an operating tire supporting position and a retracted position permitting removal of a tire from between said rollers,

adjustable means engageable with opposite sides of a tire retained by said rollers for controlling the axial position of a tire while spinning, and

means for sensing and measuring the diameter of a tire to be trimmed and for adjusting the speed of said drive means in accordance with said measurement.

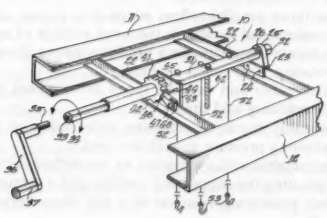
3,952,893
CAR CRANE
Joseph J. Kolesar, 48 Blackford Ave., Yonkers, N.Y. 10704
Filed Oct. 22, 1974, Ser. No. 516,898
Int. Cl.² B60R *9/00*
U.S. Cl. 214—450 **3 Claims**



1. A crane which may be readily attached to or detached from an automobile for the raising or lowering of loads to or from the top of the automobile, comprising a vertical member, a horizontal arm rotatably mounted to the top of the vertical member, a hoisting cable fastened over a pulley attached to the horizontal arm and fastened at one end to a take-up reel mounted on the vertical arm member,

said vertical member fitted on its base with means to fasten inside an automobile between the bottom of a door opening of the automobile and the frame of the closed door, with the vertical member mounted inside the automobile along the inside of the door and passing through the open window opening of the said door, such that the vertical member is held in place by its contact with the bottom of the door opening, the top of the inside of the door, and the outside of the top of the door opening.

3,952,894
SPARE TIRE HOIST
John Mendez, 1223 Essex St., Imperial Beach, Calif. 92032
Filed Dec. 2, 1974, Ser. No. 528,696
Int. Cl.² B62D *43/04*
U.S. Cl. 214—451 **1 Claim**



1. A spare tire hoist intended for use with a tire of a vehicle and adapted to be mounted intermediate a pair of opposed horizontal frame members of the vehicle, said hoist comprising, in combination:

a pair of parallel spaced apart support members each of an identical configuration and each having its end portions adapted to be affixed between said vehicle frame members to extend transversely therebetween;

a pair of ball bearing members mounted in associated housings, each housing associated with one of said support members affixed centrally thereof and extending upwardly therefrom;

an elongated cylindrically shaped shaft extending axially through said ball bearings and rotatably supported thereby for rotation in opposite directions about its axis, said shaft having a rectangular socket disposed in one end thereof and extending axially thereinto;

means for effecting rotation of said shaft in either direction about its axis including a drive bar member of rectangular cross-sectional configuration adapted to be removably inserted into said socket and to project outwardly therefrom, a lever arm having one end affixed to said drive bar with the opposite end extending outwardly radially therefrom and a hand grip handle member affixed to the free end of said lever arm and projecting outwardly normal thereto in a direction opposite of said drive bar for gripping by an individual hand to effect rotation of said lever arm about the axis of said drive bar to effect rotation of said shaft;

means for permitting unhindered rotation of said shaft in a first direction about its axis and for preventing rotation of said shaft in an opposite direction about its axis including a toothed sprocket type gear wheel affixed concentrically to said shaft positioned outwardly of said ball bearing housing adjacent one of said support members, a cog member pivotally secured at one end to said support member for pivotal rotation relative thereto in the vertical plane of said gear wheel between a position engaging said teeth of said gear wheel and a position free of said teeth of said gear wheel, a plate member affixed to said support member and extending upwardly therefrom, a boss member having one end affixed to said plate member with the opposite end thereof projecting into said plane of said cog member and a spring having one end connected to said boss member with its opposite end connected to said cog for resiliently biasing said cog into engagement with the teeth of the gear wheel;

three diametrically extending bores spaced longitudinally apart and disposed in said shaft between said support members;

three independent lengths of flexible cables each having one end extending through an associated one of said shaft bores and affixed thereto with the opposite end extending downwardly therefrom;

three hook members, each associated with the free end of one of said cables and affixed thereto;

means positively securing said tire to said support members after being hoisted thereto by operation of said shaft;

said tire hoist being further characterized by a cylindrical bore extending diametrically through said shaft parallel to said three cable bores and centrally of said shaft intermediate said support members;

a safety bolt having an enlarged head member and an elongated threaded shank member, said shank member being of a diameter to be removably inserted through said shaft aperture to project downwardly therefrom;

a safety plate of a diameter to engage the bottom surface surrounding the interior periphery of the rim of said tire;

an aperture extending centrally through said safety plate of a diameter to receive said safety bolt shank therethrough; and

a nut threadably received on said safety bolt when said tire is in an elevated position supported by said hook members and engaging said support members, said nut retaining said safety plate positively secure to said safety bolt for positive retention of said tire with respect to said

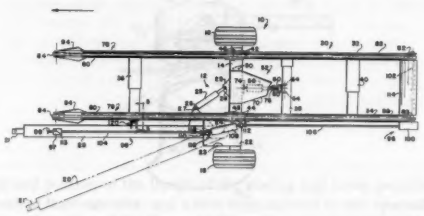
hoist.

3,952,895

LARGE ROUND BALE HANDLING APPARATUS

Willis R. Campbell, Ephrata, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Filed Dec. 5, 1974, Ser. No. 529,990
Int. Cl.² B60P 1/16
U.S. Cl. 214—506 8 Claims



1. An apparatus for handling crop material packages, such as large round bales or the like, comprising:

a transverse mobile frame adapted for movement across a field;

an elongated bed assembly mounted generally intermediately between its opposite ends to said frame at a position spaced above the field;

means for tilting said bed assembly about a horizontal axis relative to the field between a generally horizontal position and a inclined position in which one end of said bed assembly is disposed adjacent the field, said tilting means further for supporting said bed assembly at said positions relative to the field;

an elongated draft member pivotally interconnected at one end to said frame for lateral movement toward and away from one side of said bed assembly between a transport position in which a portion of said draft member is disposed closely adjacent said side of said bed assembly and a field operating position in which said portion of draft member is laterally offset from said side of said bed assembly, said draft member being adapted at the other end for attachment to a vehicle for towing said apparatus across the field; and

means for coupling said side of said bed assembly and said portion of said draft member together when said bed assembly and draft member are disposed at said transport position and said bed assembly is disposed at its horizontal position, said portion of said draft member and said side of said bed assembly being uncoupled when said draft member is disposed at said field operating position.

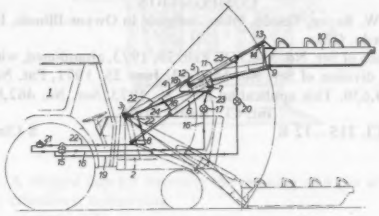
3,952,896

HYDRAULIC LINKAGES

John Albert David Hayward, Knoll Farm, Damerham, Fordingbridge, Hampshire, England

Filed Nov. 27, 1974, Ser. No. 527,936
Claims priority, application United Kingdom, Nov. 28, 1973, 55292/73
Int. Cl.² E02F 3/87
U.S. Cl. 214—771 6 Claims

1. A hydraulic linkage intended for use with a vehicle, the linkage comprising means defining a substantially horizontal axis that occupies a fixed position relative to a vehicle to which the linkage is secured in the use thereof, at least two arms turnable upwardly and downwardly about said axis, first ram means pivoted between a frame part which, in the use of the linkage, occupies a fixed position relative to said vehicle and an intermediate arm location such that, as seen in side elevation, said axis and the pivotal connections of said first ram means are at the corners of a triangle, apparatus to be lifted and lowered by the linkage, said apparatus being pivotally connected to the arms in end regions thereof remote from said axis, second ram means in operative communication with said first ram means and pivoted between said apparatus and a second intermediate arm location such that, as seen in side elevation, the pivotal connection between the arms and the apparatus and the pivotal connections of the second ram means are at the corners of a second triangle, the rams of said ram means being double-acting rams, and wherein the operative communication between the first ram means and the second ram means comprises a hydraulic duct directly and constantly interconnecting chambers at opposite sides of the pistons of rams of the respective first and second ram means such that hydraulic pressure medium expelled from one such first ram chamber by movement of the corresponding piston will pass through said duct to the communicating second ram chamber and cause movement of the other piston whereby said apparatus to be lifted and lowered by said linkage will be maintained in a given attitude during such lifting and lowering.

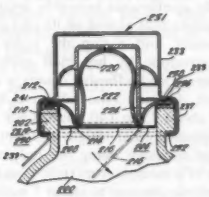


3,952,897

PRIMARY NURSER ASSEMBLY

Fred T. Pickerell, Spring City, and Dominic J. Brignola, Phoenixville, both of Pa., assignors to The West Company, Phoenixville, Pa.

Continuation-in-part of Ser. No. 331,474, Feb. 12, 1973, abandoned, which is a division of Ser. No. 154,505, June 18, 1971, Pat. No. 3,779,413. This application Apr. 29, 1974, Ser. No. 464,773
Int. Cl.² A61J 9/00
U.S. Cl. 215—11 C 3 Claims



1. The combination of a container having an access opening and a primary nurser for mounting over said access opening in said container comprising a dam member overlying the opening in said container and having an outer terminal annular edge portion confronting the surface of said container surrounding said opening therein, said dam member having a portion at least partially detachable to provide a discharge opening, a nipple made of a resilient, stretchable material having a generally cylindrical base portion of a diameter in its relaxed state less than the largest cross section of said dam member so that in assembly the base portion of said nipple overlies and underlies the outer terminal annular edge portion of said dam member and retaining means securing said nipple and dam to said container pressing said base portion underlying said annular edge portion of said dam member against the

surface of said container surrounding said access opening to provide a seal therebetween and a pusher element disposed over the feeding tip of the nipple operative upon displacement toward said dam member to effect at least partial displacement of said portion to permit discharge of the contents of the container.

3,952,898

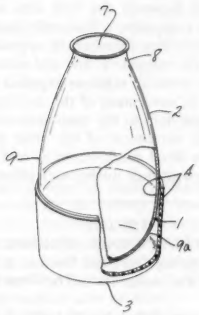
PREPARATION OF CRYSTALLINE HOT MELT COMPOSITION

John W. Bayer, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 336,769, Feb. 28, 1973, abandoned, which is a division of Ser. No. 156,693, June 25, 1971, Pat. No. 3,749,630. This application Dec. 26, 1973, Ser. No. 462,845

Int. Cl.² B65D *23/08*

U.S. Cl. 215—12 R 8 Claims



1. In a container of composite construction formed of a glass envelope having a mouth opening at one end thereof and being substantially continuous convexly arcuate in the axial section along a substantial extent of its end portion disposed opposite said mouth, and a cup-like polyethylene fitment bonded to said envelope by hot melt adhesive means the improvement wherein said adhesive means is an annular band of creep resistant thermoplastic adhesive having a tensile shear strength of about 75 to 140 pounds per 1 inch × ½ inch lap, and an average molecular weight of about 2,000 to 7,000, said thermoplastic adhesive being the polymeric product of the condensation of a monomer mixture consisting essentially of (a) a stoichiometric amount to about 7 mole percent excess of a compound of the formula

wherein R is a saturated aliphatic hydrocarbon radical of 4–10 carbon atoms, and (b) a compound of the formula NH_2—R'—OH wherein R' is a saturated aliphatic hydrocarbon radical of 2 to 6 carbon atoms, or a mixture of 70 to 99 mole percent of a compound of the formula NH_2—R'—OH, wherein R' is a saturated aliphatic hydrocarbon radical of 2 to 6 carbon atoms with 1 to 30 mole percent of a compound of the formula NH_2—R''—NH_2 wherein R'' is a saturated aliphatic hydrocarbon radical of 2 to 6 carbon atoms or a symmetrical alicyclic hydrocarbon radical of 8 carbon atoms.

3,952,899

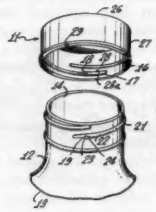
SAFETY CLOSURE CAP

Carl W. Cooke, Los Angeles, Calif., assignor to CWC Industries, Los Angeles, Calif.

Continuation-in-part of Ser. No. 479,044, June 13, 1974, Pat. No. 3,888,376. This application Nov. 8, 1974, Ser. No. 522,018

Int. Cl.² B65D *85/56, 55/02*; A61J *1/00*

U.S. Cl. 215—217 6 Claims



1. The combination of:

a container including a cylindrical neck having an open end;

a closure for said container having a top overlying said open end and a depending cylindrical skirt surrounding a portion of said neck adjacent said open end;

resilient sealing means carried by said closure and disposed between said top and said open end for sealing said open end;

continuous thread means carried on the exterior of said neck and defining a lower surface, and continuous thread means carried on the interior of said cylindrical skirt portion defining a start end and an upper surface, said thread means being adapted for engagement upon rotation of said closure to axially draw said closure into sealing relation with said resilient sealing means compressed between said open end and said closure; and

cooperating locking means carried by said continuous thread means for inter-engagement when said closure is in sealing relation with said open end, said locking means including;

a projection carried by one of said thread means and forming an integral part thereof and a corresponding cut out portion disposed on the other of said thread means, said projection and cut out portion being disposed on the respective surfaces of said thread means for registration when said closure is drawn into sealing relation with said open end, said projection being received in said cut out portion by the longitudinally upward movement of said closure responsive to the urging of said resilient sealing means whereby said upper and lower surfaces of said thread means are substantially contiguous and said thread means are locked together, and responsive to a longitudinally downward movement of said closure, said projection is moved out of said cut out portion to unlock said threads for removal of said closure from said container.

3,952,900

PACKING CONTAINER INTENDED IN PARTICULAR FOR PRESSURIZED CONTENTS

Ruben A. Rausing, Via Kenia 22-24, Rome, Italy

Filed Dec. 6, 1974, Ser. No. 530,427

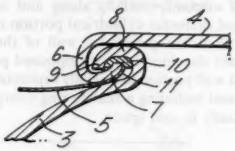
Claims priority, application Switzerland, Dec. 17, 1973, 17631/73

Int. Cl.² B65D *41/48, 53/00*

U.S. Cl. 215—232 3 Claims

1. A packing container for pressurized contents comprising a container body provided with a pouring opening having an outwardly and downwardly turned peripheral flange, a sealing cap provided with a downwardly, inwardly and upwardly

turned peripheral flange for interlockingly engaging the outwardly and downwardly turned flange of said container body, a sealing compound disposed circumferentially between the interlocking flanges to seal the circumferential edge of one of said flanges with the other flange, the edge of the upwardly



turned portion of the flange of the sealing cap being provided with at least one slot, and a tear strip secured to the upwardly turned portion of the flange of the sealing cap adjacent said at least one slot, said tear strip extending to the outside of the package container for easy access to tear off said sealing cap.

3,952,901

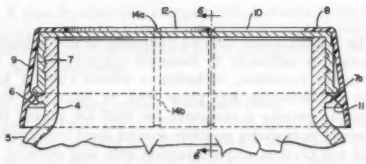
TAMPER-PROOF OVERCAP CONSTRUCTION

Vincent N. Conti, West Hempstead, N.Y., assignor to Dairy Cap Corporation, Jamaica, N.Y.

Continuation-in-part of Ser. No. 485,081, July 2, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 544,518

Int. Cl.² B65D *41/62*, *51/18*

U.S. Cl. 215—251 **14 Claims**



1. An overcap adapted for receipt on a container over a closure cap for said container and in surrounding relation with said closure cap to prevent unauthorized removal of said closure cap and opening of said container, said overcap comprising:

a. a body, said body including,

1. an upper surface adapted to overlie the top of the closure cap, and

2. a skirt depending circumferentially from the upper surface and adapted to encircle the closure cap, said skirt having an internal diameter which is greater than the external diameter of said closure cap to provide a radial space between said skirt and closure cap when the overcap is received on the container in surrounding relation with the closure cap to preclude frictional coupling of the overcap with the closure cap, said skirt further being formed of plastic, said plastic being relatively unyieldable to prevent movement of the skirt radially inwardly under compressive forces into surface-to-surface friction driving contact with said closure cap; and

b. pull tab means carried by said body for tearing said body in a telltale manner to permit access to said closure cap.

3,952,902

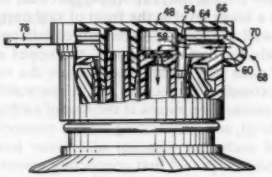
CLOSURE CAP FOR PLASMA RECEIVING ASSEMBLY

Myron R. Prouty, Oakland, and Robert D. Tuseth, Alameda, both of Calif., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Apr. 26, 1974, Ser. No. 464,463

Int. Cl.² B65D *51/16*

U.S. Cl. 215—306 **17 Claims**



1. A closure cap for covering the opening of a gas sterilizable container, comprising

a. a cover; and

b. base means for securing said cover to the container to seal the container opening, said base means including

1. liquid access means integral with said base means for permitting liquid to be introduced into said container through said base means,

2. gas access means integral with said base means for permitting gas to pass into and out of the container through the container opening,

3. cover retaining means for securing said cover to said base means in a fully closed position to hermetically seal the container, and

4. cover engaging means for engaging and supporting said cover in a stable partially open position relative to said base means displaced from the fully closed position, said cover engaging means forming a gas passage when said cover is in said partially open position for permitting gases to enter the container and contact all surfaces of said base means and said cover which are exposed to the interior of the container when said cover is secured to said base means in a fully closed position.

3,952,903

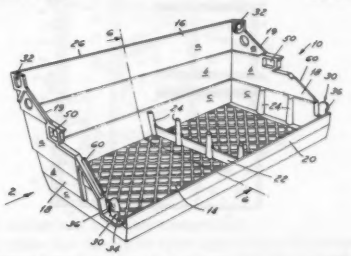
CLOSED CONTAINER

Ellsworth E. Sanders, Sanibel Island, Fla., and Elsmer W. Kreeger, Bloomfield, Mich., assignors to Pinckney Molded Plastics, Inc., Pinckney, Mich.

Filed Oct. 21, 1974, Ser. No. 516,460

Int. Cl.² B65D *21/02*, *11/10*

U.S. Cl. 220—4 E **11 Claims**



1. A substantially closed container having spaced, parallel, substantially rectangular top and bottom walls, spaced parallel, substantially rectangular front and rear walls, and spaced, parallel, substantially rectangular side walls and being composed of identical separable upper and lower container parts each of one-piece construction, each part being adapted for

use independently of the other for display purposes and having a substantially rectangular base, a generally upright substantially rectangular high wall at the rear of said base, a generally upright substantially rectangular low wall at the front of said base of substantially lesser height than said high wall, a pair of generally upright side walls at each side of said base, the front and top of each part being substantially open and the upper edges of the side walls thereof extending generally diagonally from an upper level at the rear of said part near the top of said high wall to a lower level at the front of said part near the top of said low wall to expose the contents of said part when used independently for display purposes, the upper edge of each side wall of each part having intermediate the ends thereof a forwardly extending projection and a rearwardly extending recess, first connecting means at the rear of each part adjacent said upper level, and cooperating second connecting means at the front of each part adjacent said lower level releasably interengageable with said first connecting means of the other part, the upper part being inverted, turned end for end and superposed over the lower part and said first and second connecting means of one part being respectively interengaged with said second and first connecting means of the other to form said substantially closed container, the bases of said upper and lower parts respectively forming the top and bottom walls of said container, the high wall of said lower part cooperating with the low wall of said upper part to form the rear wall of said container and the low wall of said lower part copperating with the high wall of said upper part to form the front wall of said container, and the side walls of said upper part respectively cooperating with the side walls of said lower part to form the side walls of said container, the projections on the side walls of each part fitting in the recesses in the side walls of the other so as to resist vertical separation of the parts when assembled together to form said container as aforesaid.

3,952,904

CONTAINER, PARTICULARLY A BEER BARREL

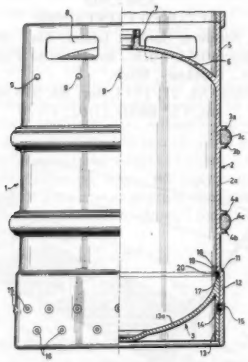
Marius Alphonsus Johannes Verlinden, 1061, Landrestraat, The Hague, Netherlands

Filed Sept. 3, 1974, Ser. No. 502,469

Claims priority, application Belgium, Sept. 12, 1973, 135571

Int. Cl.² B65D *7/02, 7/42*

U.S. Cl. 220—5 R **10 Claims**



1. Pressure barrel, particularly a beer barrel, comprising a first part made of plastics in the form of a vessel open at one end and having a peripheral wall, and a second part, also of plastics, fitted sealingly in said open end of said first part and forming a closure for said open end, the peripheral wall of the first part having an intermediate portion and an enlarged diameter cylindrical portion;

said intermediate portion merging radially with said enlarged diameter portion near said open end and forming an internal annular shoulder facing said open end;

said second part including an end wall portion and a cylindrical peripheral wall at the periphery of said end wall portion, said enlarged diameter portion of said first part receiving with a close fit therein the cylindrical peripheral wall of the second part to obtain a sealed transition between the shoulder and the opposed peripheral edge of the end wall portion, and a number of supersonic welds distributed circumferentially along and interconnecting the enlarged diameter cylindrical portion of the first part and the cylindrical peripheral wall of the second part, wherein said shoulder and said opposed peripheral edge of said end wall portion are axially separated by an undercut space and including a sealing ring compressably sandwiched axially in said space.

3,952,905

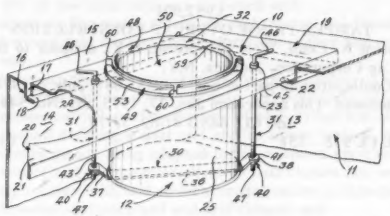
CONTAINER HOLDER FOR ICE CREAM CABINET OR THE LIKE

Howard J. Rumrill, Gloversville, N.Y., assignor to Pet Incorporated, St. Louis, Mo.

Filed Sept. 23, 1974, Ser. No. 508,686

Int. Cl.² A47B *57/18, 77/18;* **A47F** *3/022, 3/04*

U.S. Cl. 220—14 **11 Claims**



1. In a refrigerated cabinet operating at low refrigeration temperatures sufficient to maintain ice cream in a frozen dispensable condition, including a closed cabinet housing having a removable top plate with at least one opening adapted to receive a container for bulk ice cream; the improvement comprising multiple spaced apart cut-outs formed in said top plate in communication with said opening, and a container holder including an annular top retaining collar having outwardly extending means receivable in said cut-outs and movable laterally therefrom to removably lock said retaining collar with the top plate, said retaining collar having inwardly extending means to define a smaller opening for access to said container, bottom support means disposed below said retaining collar to support said container, and vertical adjusting rods extending through said top plate and threadedly engaged with said bottom support for vertically adjusting the bottom support to firmly engage the top of said container against said top retaining collar.

2. A container holder for use in a refrigerated cabinet having a top plate with an opening to receive a container of refrigerated product to be dispensed, said holder including a bottom support in spaced relation below the opening in the top plate and adapted to seat the container, top retaining means adapted to be positioned in the opening and removably locked with said top plate, said top retaining means including an inwardly extending abutment portion defining a central opening for access to the container, said abutment portion being spaced from said bottom support and adapted to be engaged by a container seated on the bottom support, and vertical means having an upper portion journalled substantially in the plane of said top plate and a lower end adjustably engaged with said bottom support whereby the bottom support is adapted to be vertically adjusted relative to the top

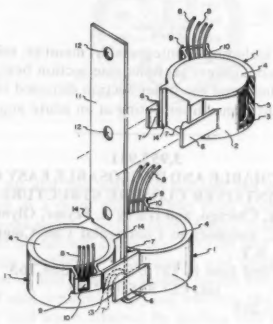
retaining means for removably securing the container therebetween.

3,952,906

CASE FOR ELECTRICAL COMPONENTS

Thomas Georgopulos, Chicago, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 31, 1973, Ser. No. 411,583
Int. Cl.² B65D *25/24*
U.S. Cl. 220—18 5 Claims



1. A case for electrical components, said case being adapted to be releasably attached to a mounting standard having a pair of spaced apart edges and being of a predetermined thickness, said case comprising:

a floor;

a wall extending upward from said floor;

a spaced apart pair of flexible arms integral with and extending outward in spaced apart parallel planes from said wall, the free ends of said arms including curved, inwardly facing projections defining angled surfaces, which force said arms to flex outwardly when pressed against the edges of the support so that the free ends of said arms can pass over the edges of the support, and inner edges which engage and capture the mounting support between said arms; and

a pair of spacer ribs positioned between said arms and extending outward from said wall in spaced apart parallel planes so as to provide a free space between them for receiving therein fastening means, the length of said pair of spacer ribs being proportioned so that the distance between the terminal ends thereof and said inner edges of said arms is only slightly greater than the thickness of the mounting support to thereby form a reasonably tight fit between said case and the mounting support,

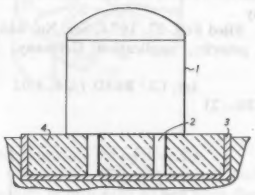
said case being attached to said mounting standard by pressing the angled surfaces on said free ends of said arms against said spaced apart edges of the mounting standard to thereby cause said arms to flex outward to pass said projections over said edges and behind the mounting standard to capture the mounting standard between the terminal ends of said spacer ribs and said inner edges of said projections, the free space between said spacer ribs permitting said case to be attached to the mounting standard directly opposite fastening means with said spacer means straddling the fastening means.

3,952,907

LIQUID STORAGE INSTALLATIONS

Dennis H. Ogden, Wolverhampton, and George Inverarity, Brierley Hill, both of England, assignors to British Industrial Plastics Limited, Manchester, England

Filed Nov. 25, 1974, Ser. No. 527,157
Claims priority, application United Kingdom, Nov. 24, 1973, 54674/73
Int. Cl.² B65D *87/00*
U.S. Cl. 220—18 9 Claims



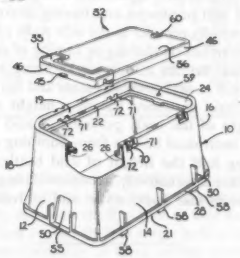
1. A liquid storage installation comprising tank means for storage of a liquid of the class including inflammable liquids and liquids which produce fumes of the volatile, noxious, corrosive and the like type; bund means below the tank means for entrapment of such liquid spilled from the tank means and of a size generally corresponding in volume to at least that of said tank means, said bund means including bottom and side walls, and protective means for protecting the environment from harmful effects of such liquid when spilled into the bund means; the protective means comprising a body of non-inflammable material permeable to the liquid, essentially impermeable to water whereby it may be exposed to the elements, having relatively low thermal conductivity, and selected from the group consisting of an aminoplast resin foam, a phenolic resin foam and a urethane resin foam, said body of non-inflammable material covering the bund bottom wall.

3,952,908

METER BOX AND COVER

John Reese Carson, Chapman Woods Road, Pasadena, Calif. 91107

Filed Aug. 1, 1975, Ser. No. 601,047
Int. Cl.² B65D *25/24*
U.S. Cl. 220—18 13 Claims



1. A meter box assembly comprising:

a. a meter box having an open upper top with an upwardly extending rim member terminating on the inside surface of said box near the top thereof in an inwardly extending ledge member; and

b. a cover arranged and configured so as to rest on said ledge member and confront said rim on said box, said cover comprising first and second sections and means for rotatably joining said first and second sections together,

said first section having means for engaging said meter box so as to render said fist section substantially immovable therein, said second section having means for lifting said second section and moving said second section about said means rotatably joining said first and said second sections together

whereby said meter box is selectively opened and closed.

3,952,909

BOTTLE CASE OF PLASTIC

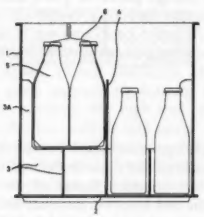
Ulrich Heinrich Prodel, Grunstrasse 13, 4902 Bad Salzuflen, Germany

Filed Feb. 27, 1974, Ser. No. 446,206

Claims priority, application Germany, Mar. 8, 1973, 2311419

Int. Cl.² B65D *1/24, 1/02*

U.S. Cl. 220—21 4 Claims



1. A bottle packing for returnable bottles having body portions and necks, comprising a stackable bottle case of plastic comprising four side walls provided on top and bottom with edge reinforcements, a bottom, and crossing partitions extending between opposite side walls and upwardly from said bottom to divide the interior of said case into individual bottle compartments, said partitions having upper edges parallel to said bottom, a plurality of multiple bottle packs disposed between said side walls and resting on the upper edges of at least some of said partitions, each of said packs comprising a plurality of bottles in a carriable container, the height of said side walls being at least equal to the height of said partitions on which said packs rest plus the height of said bottles, and the inside cross sectional area of said case being greater than the combined cross sectional area of the packs received therein, and spacers extending inwardly from side walls of said case, said spacers comprising upwardly extending portions of at least some of said partitions and having abutment edge faces extending upwardly parallel to the side walls and engaging said packs to prevent lateral shifting or tipping of said packs in said case, individual bottles not in packs being receivable in an upright position in said compartments and being supported by said bottom, said partitions having a height at least equal to half the height of the body portions of said bottles so as to prevent said individual bottles from bumping one another but not exceeding half the height of said bottles including said necks, said case alternatively accommodating the same number of bottles in said packs as in said individual bottle compartments.

3,952,910

SELF-SEALING CONTAINER CLOSURE

Richard A. Wheeler, 3711 San Felipe, Apartment 4A, Houston, Tex. 77027

Filed Sept. 4, 1975, Ser. No. 610,354

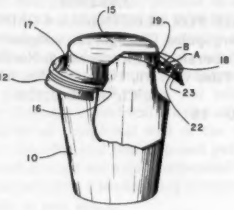
Int. Cl.² A47G *19/22*

U.S. Cl. 220—90.4 16 Claims

1. A self-sealing container closure comprising:

a central face having an aperture therethrough defined by overlapping edges,

a skirt extending from the periphery of the central face, said skirt having an integral engaging means formed on the inner face of the skirt for seating engagement with a rim portion of a container,



said means including an integral skirt member, said member having two adjacent sections, one section being disposed in one plane and the other section disposed in a second plane, said planes intersecting at an acute angle.

3,952,911

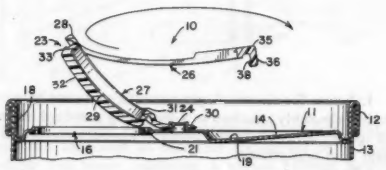
NON-DETACHABLE AND RECLOSABLE EASY OPENING CONTAINER CLOSURE STRUCTURE

John S. Bozek, Chicago, and Harry A. Peyser, Olympia Fields, both of Ill., assignors to Continental Can Company, Inc., New York, N.Y.

Filed June 8, 1973, Ser. No. 368,163

Int. Cl.² B65D *41/46*

U.S. Cl. 220—269 9 Claims



1. An easy opening end closure for a container, said end closure comprising a panel, an opening in said panel, a tab having an integral closure portion for said opening, means releasably bonding said closure portion to said panel surrounding said opening, pivot means pivotally connecting said closure portion to said panel for pivoting about an axis disposed substantially normal to said panel so that said closure portion may be turned between a position closing said opening and a position spaced from said opening when said closure portion is released from said panel, said tab including a finger grip portion in the form of a closed loop encompassing said closure portion, said loop being connected to said closure portion at a point located opposite the connection to said pivot means.

3,952,912

CONTAINER WITH ATTACHED CLOSURE

Walter Merton Perry, 76 Locust Hill Road, Darien, Conn. 06820

Continuation-in-part of Ser. No. 231,124, March 2, 1972, Pat. No. 3,843,011. This application Oct. 11, 1974, Ser. No. 514,069

Int. Cl.² B65D *41/32*

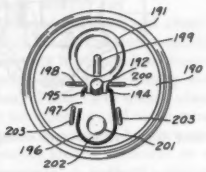
U.S. Cl. 220—269 17 Claims

1. In an easy open container having a top with easy opening means therein, which said opening means comprises an opening formed in said container top, a downwardly hingeable closure positioned across and bridging said opening and posi-

tioned just below said opening and with said closure larger than said opening to resist pressure from within said container, and with part of the periphery of said closure attached to said top to form a hingeable attachment section, and with frangible sealing means between said closure and said container top to seal said top against leakage.

the improvement comprising

a lift tab to facilitate opening of said closure, said lift tab having at least a substantial portion thereof overlying said closure, and said lift tab having a fulcrum end and an



outer lift end, and with said fulcrum end secured to said closure at a point spaced away from said hingeable attachment section, and whereby raising said outer lift end of said lift tab will cause said fulcrum end to bend down an edge section of said closure and thereby rupture a section of said frangible sealing means and initiate opening of said container top, and whereby the further opening of said top is attained by pushing said closure downward, and causing it to hinge down into said container to form an opening.

3,952,913

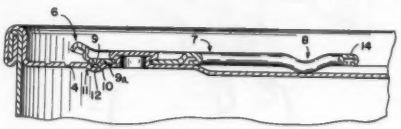
TAB ANTI-ROTATION AND HOLD DOWN DEVICE

Nick S. Khoury, Worth, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,681

Int. Cl.² B65D *41/32*

U.S. Cl. 220—273 **1 Claim**



1. An improved pull tab mounting arrangement for an easy-open end closure member, said end closure member comprising an end panel, a pull tab, means attaching said tab to said end panel intermediate its ends, said tab having a nose portion at one end and a finger-grip portion at the other end, a score line formed in said end panel and defining an opening flap therein, the improvement comprising tang means on the nose portion for interlocking engagement of said tab and said end panel for holding the pull tab in opening association to said score line, and retention means formed in said end panel for retaining said tang means, said tang means comprising a panelwardly directed protrusion having sharp jagged points impaled into said retention means, said tang means holding said nose portion in spaced relation to said end panel and co-operating with said attaching means to panelwardly bias said finger-grip portion and hold the same against said end panel, said retention means comprising a recess formed in said end panel and having a base and said protrusion being impaled in said base.

3,952,914

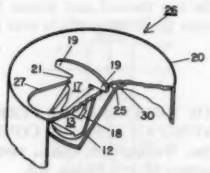
RE-SEALABLE CONTAINER LID

Kuno J. Vogt, 5854 Kantor Court, San Diego, Calif. 92122

Filed Feb. 24, 1975, Ser. No. 552,340

Int. Cl.² B65D *43/14, 51/04*

U.S. Cl. 220—339 **4 Claims**



1. A re-sealable container lid comprising:

a lid section constructed of rigid material and having a pouring aperture in proximity to one edge thereof;

a removable seal constructed of a displaceable material, sealably disposed in said pouring aperture;

a notched sealing recess around the periphery of said seal dimensioned for receiving the edge of said pouring aperture in a sealed condition; and

a mounting pad extending from said removable seal and being attached on one side to a bottom surface of said rigid lid section.

3,952,915

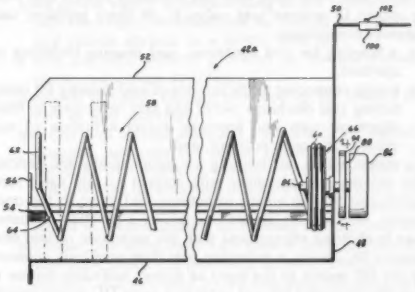
DELIVERY UNIT FOR HELICAL FEED MERCHANDISING MACHINE

Irving Pitel, Edison; Richard S. Silverman, Springfield, and Richard J. Mueller, Mountain Lakes, all of N.J., assignors to Rowe International, Inc., Whippany, N.J.

Filed Mar. 22, 1974, Ser. No. 453,885

Int. Cl.² G07F *11/36*

U.S. Cl. 221—75 **17 Claims**



1. A delivery unit for feeding articles to the delivery area of a merchandising machine including in combination, a generally horizontally disposed shelf, a pair of side walls extending from front to back of said shelf, a single helical delivery member formed with a plurality of turns, means on said side walls at locations spaced vertically from said shelf for rotatably supporting outer surface portions of the turns of said helical member on both sides of the longitudinal axis thereof to support said delivery member above the surface of said shelf with the turns thereof spaced vertically from the surface of said shelf throughout the length of said member and with said member extending generally from front to back of said shelf, at least the central portions of the spaces between adjacent turns of said helical member being free of obstructing structural members and said helical member being spaced above

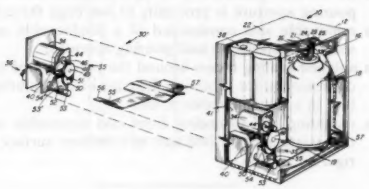
said shelf by such a distance that an article supported by said shelf at one of said central locations extends below the lower portions of the turns of said helix into engagement with said shelf and above the upper portions of the turns of said helical member to cause said lower portions of the turns of said helix to engage an article above the bottom thereof and said upper portions of the turns of said helical member to engage an article below the top thereof and means for rotating said member to advance the leading article over the front edge of said shelf.

3,952,916

AUTOMATIC DISPENSER FOR PERIODICALLY ACTUATING AN AEROSOL CONTAINER

Stanley J. Phillips, Wallingford, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jan. 6, 1975, Ser. No. 538,701
Int. Cl.² B67D *5/08, 5/64*
U.S. Cl. 222—70 **3 Claims**



1. An automatic dispenser for periodically actuating a replaceable aerosol container to discharge a quantity of the contents of said container; said container including a valve, means for biasing said valve to a closed position, an outwardly extending valve stem having an internal passage in fluid communication with said valve, and a discharge outlet in fluid communication with said passage, said container discharging a quantity of the contents therein through said valve, said passage and said discharge outlet upon relative movement between said valve stem and said container against said biasing means to actuate said valve to an open position; said dispenser comprising:

a. a housing for said container, said housing including an aperture,

b. means connected to the interior of said housing for maintaining said discharge outlet and said valve stem in fixed alignment with said aperture during actuation of said valve to the open position, and

c. means within said housing for automatically and periodically moving said container with respect to said valve stem against said biasing means to actuate said valve to the open positon, said moving means comprising a pivotally mounted lever in abutting engagement with the underside of said container, a DC motor, a reduction gear train positively connecting the DC motor to the lever to deliver sufficient torque to pivot the lever and lift said container upon DC motor energization, said reduction gear train and positively connected DC motor further enabling the bias of the weight of said container to return the lever to its normally disposed position when the DC motor is de-energized, a supply of DC power, and a timing circuit coupling the DC power supply to the DC motor, said timing circuit producing output power pulses to periodically energize the DC motor for sufficient duration to pivot the lever and lift said container to actuate said valve to the open position, the power pulses from said timing circuit being of sufficient duration to stall the DC motor after opening said valve, said lever being pivoted in a reverse direction to its normal position at the end of each power pulse to prepare for a succeeding power pulse from the timing circuit,

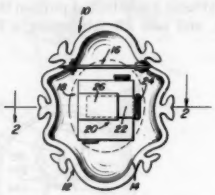
d. whereby a quantity of the contents of said container is discharged from said discharge outlet through said aperture.

3,952,917

PERFUME OR COLOGNE DISPENSER

Lawrence J. Gause, Bakersfield, Calif., assignor to Otho C. Crouse, Bakersfield, Calif., a part interest

Filed Jan. 8, 1975, Ser. No. 539,525
Int. Cl.² A44C *15/00*
U.S. Cl. 222—78 **5 Claims**



1. A dispenser for perfume and cologne, comprising, in combination:

a. a body member forming an ornamental setting and provided with a cavity;

b. a dispensing unit removably arranged in the cavity of the body member; and

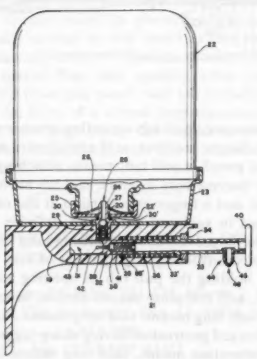
c. retaining means for removably holding the dispensing unit within the cavity of the body member, said retaining means including an arm pivotally mounted on the body member, socket means provided on the dispensing unit for removably receiving the arm, the dispensing unit including a container, an outlet valve provided on the container for permitting selective dispensing of a substance in the container under pressure, and an intake valve also provided on the container for permitting selective refilling of the container with a substance to be dispensed.

3,952,918

FLUID DISPENSER APPARATUS

Edward J. Poitras, Holliston, and Edwin W. Wlodyka, Ashland, both of Mass., assignors to Highland Laboratories, Ashland, Mass.

Filed Mar. 18, 1974, Ser. No. 451,813
Int. Cl.² B67B *7/24*
U.S. Cl. 222—82 **6 Claims**



1. A manually operated pump apparatus for dispensing fluids from a container and comprising:

support means for receiving and supporting the container in an operating position;

puncture means for automatically puncturing the surface of the container in response to movement thereof into the operative position;

passage means for receiving fluid through an opening in the container;

pump means coupled to said passage means for receiving fluid therefrom, said pump means comprising chamber means for receiving a measured amount of fluid from said passage means, outlet means for draining said chamber means during operation of said pump means, and a hand operated piston means hollow thru-out its length with one end that defines a movable wall of said chamber means and a portion spaced from said one end and supporting said outlet means; and

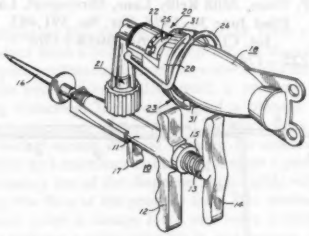
valve means positioned between said chamber means and said hollow piston means said outlet means comprising an outlet valve, opening in response to pressure in said hollow piston, spring bias means biasing said valve means closed and wherein said valve means comprises pressure release means for opening said valve means in response to a given differential pressure between said chamber and said hollow piston means sufficient to overcome said spring bias means and further comprises mechanical release means for opening said valve means at a predetermined position in the cycle of operation of said pump.

3,952,919

RESERVOIR ADAPTER FOR LIQUID DISPENSER

John Erik Hansen, Arvada, Colo.; Joseph M. Magrath, McCook, Nebr., and Leonard L. Hierath, Denver, Colo., assignors to Joseph M. Magrath, McCook, Nebr.

Filed July 3, 1975, Ser. No. 593,128
Int. Cl.² B67B 7/26
U.S. Cl. 222—89 **9 Claims**



1. An adapter for connecting a closed collapsible liquid supply reservoir to a liquid metering dispenser of the repeating type comprising:

a fitting having a passage therethrough for connection to the inlet of a dispenser;

a hollow needle having a seal piercing end;

means for mounting said needle on said fitting in communication with the passage therein, said means including a nut threaded on said fitting for securing said needle on the fitting with said seal piercing end extending axially beyond said nut;

a clamping member mounted on said nut and having jaw members adjacent said piercing end for receiving and holding a supply reservoir; and,

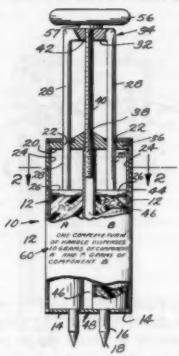
movable locking means mounted on said adapter for moving said jaw members into clamping position and locking them, to hold the supply reservoir securely against said nut.

3,952,920

DISPENSER FOR MULTI-COMPONENT PRODUCTS

Carl Bergman, Pompano Beach, Fla., assignor to Bridgeport Chemical Corporation, Pompano Beach, Fla.

Filed Dec. 30, 1974, Ser. No. 537,332
Int. Cl.² B67D 5/52
U.S. Cl. 222—137 **5 Claims**



1. A dispenser for multi-component products, comprising:

sidewall means defining a plurality of individual chambers;

means including a unitary end wall member secured to each chamber maintaining the chambers fixed, laterally adjacent relationship as a unitary structure;

one end wall means closing one end of each chamber, each one end wall means including a dispenser spout;

a piston slidingly received in each chamber;

an extrudable product component contained in each chamber between the respective piston and the respective dispenser spout;

a piston rod secured to each piston and projecting out of the opposite end of the respective chamber through said unitary end wall member;

yoke means rigidly interconnecting all the piston rods outside the respective chambers, so that all the piston rods and pistons advance as a unitary structure;

a first threaded element provided on the interconnected piston rod unitary structure;

a second threaded element provided on the unitary structure of said chambers;

the first and second threaded elements being threadably engaged, and only one of the threaded elements being rotatable with respect to the unitary structure upon which it is provided the rotatable threaded element being constituted by an exteriorly threaded, elongated operator journalled in means defining an opening through said arm;

the other one being fixed with respect to the unitary structure upon which it is provided, the nonrotatable threaded element is constituted by an internally threaded nut, so that as threaded element is rotated in one angular sense, the piston rod unitary structure is advanced further into said chambers, thereby dispensing a uniform amount of each product component from each respective spout for each unit of such rotation;

an operating handle secured to the operator for use in rotating the same;

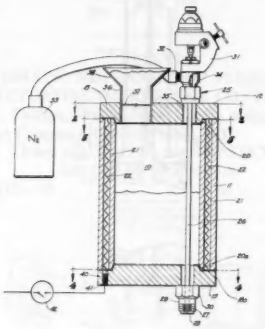
the sidewall means of each chamber being constituted by a respective tubular member and said means secured to each chamber further comprising a common over-wrap of all said tubular members, said operator being received laterally among the exteriors of said tubular members but within the interior of said common over-wrap, whereby both threaded elements are disposed out of contact with the extrudable product components contained in the chambers of said dispenser.

3,952,921

APPARATUS AND METHOD FOR APPLICATION OF HOT-MELT RESIN ADHESIVE

Donald E. Tanner, Owenton, Ky., assignor to D & T Manufacturing Co., Cincinnati, Ohio

Filed Nov. 15, 1973, Ser. No. 416,100
Int. Cl.² B67D 5/62
U.S. Cl. 222—146 HE 8 Claims



1. A method of applying a hot-melt resin adhesive of the type which becomes flowable at temperatures of about 600°F or higher, comprising the steps of:

providing an enclosed chamber having a restricted discharge orifice in the lower portion thereof, a valve element for opening and closing said orifice, and means for moving said valve element between open and closed positions;

introducing a particulate charge of said hot-melt resin adhesive into said chamber;

introducing a non-oxidizing gas into the upper portion of said chamber at super-atmospheric pressure;

applying uniformly distributed heat to said charge of resin;

controlling the temperature of said chamber to a predetermined maximum of 600° to 700° F sufficient to cause said resin adhesive to attain a highly viscous, flowable condition; and

causing said means for moving said valve element to reciprocate said valve element rapidly between open and closed positions up to 200 times per minute, whereby said non-oxidizing gas under super-atmospheric pressure forces a drop of said flowable resin adhesive through said orifice each time said valve element is in the open position.

3,952,922

PRECESSING BOTTOM POUR STOPPER HAVING SWINGING MOVEMENT

Edwin D. Ditto, Bloomfield Hills, and A. Hadi K. Akeel, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

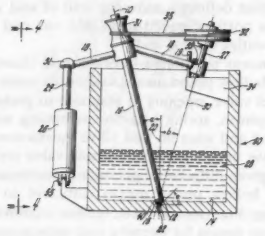
Filed June 27, 1975, Ser. No. 591,141
Int. Cl.² B22D 41/10
U.S. Cl. 222—148 3 Claims

1. A bottom pour stopper mechanism, suitable for use with a vessel for holding and pouring molten metal and the like, for precisely controlling the intermittent flow of molten metal through a tap hole in the bottom of the vessel over a prolonged period despite the presence of slag particles or other debris in the area of the tap hole, the tap hole having a substantially conical sealing surface at the inner surface of the vessel, the mechanism comprising:

a. a rigid cylindrical stopper disposed in the vessel and movable between a tap hole open position and a tap hole closed position, the stopper having a substantially hemispherical end adapted to fit in sealing engagement with the conical sealing surface of the tap hole in said closed position, the stopper further being disposed such that when it is in the closed position the longitudinal axis of the cylindrical stopper is at an acute angle with and intersecting the axis of the tap hole;

b. stopper support means mounted on the vessel;

c. means for raising and lowering the support means to move the stopper between its said open and closed positions;



d. means for rotating the cylindrical stopper about its longitudinal axis, the stopper rotating means being mounted on the vessel; and

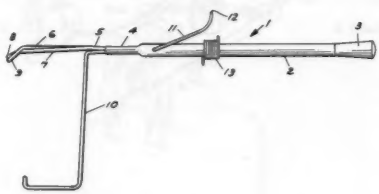
e. means for revolving the stopper about its lower end so as to define a portion of a conical surface as the stopper rotates on its own axis, the revolving means being mounted on the vessel, wherein the rotation and revolution of said stopper, as it engages the seat portion of the tap hole, acts to abrasively clean and seal the tap hole by directly pushing debris from between the engaging surfaces.

3,952,923

CANISTER TOOL

Thomas P. Tison, 3808 Reilly Lane, Shreveport, La. 71101

Filed June 30, 1975, Ser. No. 591,403
Int. Cl.² B67D 5/64; B05B 15/06
U.S. Cl. 222—174 10 Claims



1. A canister tool comprising:

a. an arm of selected length;

b. at least one canister support attached to one end of said arm and disposed forward of and beneath said one end of said arm to receive a canister;

c. clamp means attached to the same end of said arm as said canister support to engage and secure a canister placed in said canister support;

d. a spray activator in pivotal cooperation with said arm and adapted to releasably engage the canister actuator of a canister; and

e. a slide keeper concentrically and slidably cooperating with said arm and said spray activator, whereby when a canister is fitted into said canister tool in cooperation with said canister support and said clamp means, and said spray activator is positioned to pivotally engage said canister actuator, and said slide keeper is positioned so as to slidably engage said spray activator to bias said spray

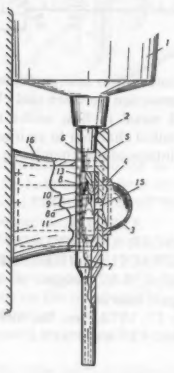
activator downwardly against said canister actuator, spray emits from said canister.

3,952,924

DISPENSER FOR DISPENSING A LIQUID OR PASTY PRODUCT FROM A CONTAINER

Gustav Eric Valdemar Benson, Fridhemsvagen 20, 217 74 Malmo, Sweden

Continuation of Ser. No. 281,873, Aug. 18, 1972, abandoned, which is a continuation of Ser. No. 874,345, Nov. 5, 1969, abandoned. This application May 31, 1974, Ser. No. 475,303
Claims priority, application Sweden, Nov. 8, 1968, 15138/68
Int. Cl.² B67D 5/06
U.S. Cl. 222—181 7 Claims



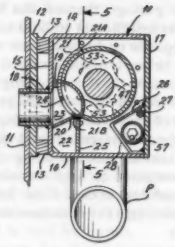
1. A dispenser for dispensing in dosage form a liquid or pasty product from a container comprising: a dispenser housing having means therein defining a product inlet for receiving therein the product to be dispensed, a product outlet for dispensing therefrom the product, and a passage providing fluid communication between said product inlet and said product outlet; means on said housing for connecting said product inlet to a container containing therein a product to be disposed during use of the dispenser; actuatable valve means for valving the flow of the product from said product inlet to said product outlet in dosage form, said valve means comprising means defining a valve chamber in said passage, and a pair of valve members fixedly disposed in said valve chamber in spaced-apart relationship from each other along the main direction of product flow, each valve member having a funnel-shaped configuration composed of a body portion and a resiliently flexible flared portion terminating in an annular lip which is resiliently flexible into and out of engagement with a peripheral portion of said valve chamber and each valve member having a normal at rest position wherein its annular lip contacts the valve chamber peripheral portion to block flow therepast of the product and actuatable to a closed position wherein its annular lip is flexed outwardly against said valve chamber peripheral portion to more effectively block flow therepast of the product and to an open position wherein its annular lip is flexed inwardly away from said valve chamber peripheral portion to permit flow therepast of the product; and actuating means for alternately actuating said pair of valve members to their open and closed positions in out of phase relationship with respect to each other so that one valve member is in the open position while the other valve member is in the closed position to effect dispensing of the product in dosage form from said product outlet.

3,952,925

FLOW CONTROL SYSTEM AND ROTARY FLOW CONTROL VALVE

Momir Babunovic, Des Peres, and Mihai A. Bulboaca, St. Louis County, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Feb. 5, 1975, Ser. No. 547,236
Int. Cl.² B67D 3/00
U.S. Cl. 222—485 10 Claims



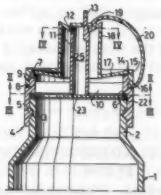
1. In a fluid flow control system having a pressure fluid supply and a plurality of discharge lines for receiving and discharging the same supply fluid, the improvement of a housing providing a chamber to receive the pressure fluid, means in said housing forming a plurality of separated fluid discharge ports in communication with the discharge lines, flow regulating means operably mounted in said housing adjacent said ports to successively open and close said ports such that the closing of one port is followed by the opening of another port, and an elongated fluid discharge flow-boosting flexible-walled expandable-collapsible means in said housing positioned adjacent all of said ports in position to absorb and store the energy of fluid flow interruption by each port closing and return the absorbed stored energy to freely boost the flow at the next port opening, whereby said flow boosting expandable-collapsible means substantially overcomes friction losses by being adjacent all of said ports.

3,952,926

SELF-CLOSING CLOSURES

Billy Nilson, Finnstugaten 30, 9500 Mjolby, Sweden

Filed Dec. 14, 1973, Ser. No. 424,919
Int. Cl.² B65D 35/50
U.S. Cl. 222—494 3 Claims



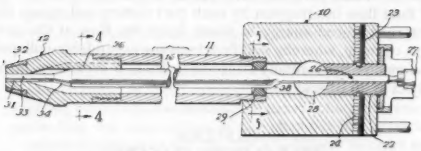
1. A self-closing closure comprising a first member and a second member, said members being mutually connected along their outer portions, said first member having extending from said outer portion a flexible and resilient diaphragm portion having a centrally disposed discharge opening and said second member having a centrally located, axially extending stem, said stem being connected to the outer portion of said second member by means of rib like elements, one end of said stem being adapted to seal position discharge opening of said diaphragm portion in the initial position of said members, said members being adapted to be connected to a squeezable container such that a pressure exerted upon the content of said container, preferably by exerting a manual pressure upon said container, will enable said diaphragm to raise into an

active position in which said discharge opening is free of said stem causing a dispensing of the content from said container through said discharge opening, said diaphragm returning by means of its resilient bias to its initial position when said pressure ceases, said stem having an air passage axially extending from said end formed therethrough, said air passage forming a communication between the atmosphere and the interior of said container, a valve means being adapted to normally contact with a resilient bias the opposite end of said stem to seal the air passage thereof, the bias of said valve means being however insufficient to hold said valve means in contact with said opposite end of said stem when the pressure in said container is below a predetermined value lower than the atmospheric pressure thereby enabling air to be sucked into said container through said air passage in said stem, the first mentioned end of said stem being adapted not to axially project over the upper surface of said diaphragm portion surrounding it and said air passage being calibrated to allow fluid of the kind contained in said container to flow therethrough thereby enabling excess fluid from the discharge process to be re-sucked into the container simultaneously with the sucking in of air.

3,952,927
INJECTION NOZZLE HAVING GUIDES FOR NOZZLE ROD

Ernest C. Schaumburg, North St.Paul, and Robert K. Larson, St. Paul, both of Minn., assignors to Standard Oil Company, Chicago, Ill.

Continuation of Ser. No. 464,311, April 26, 1974, abandoned. This application June 23, 1975, Ser. No. 589,399
Int. Cl.² B29F 1/03
U.S. Cl. 222—510 **6 Claims**



5. In an injection molding nozzle assembly wherein a nozzle rod moves back and forth to open and close an outlet port in a nozzle and wherein said nozzle rod is supported in the nozzle by a support means, the improvement which comprises said support means in said nozzle to guide the forward end of said nozzle rod being so arranged that no surface on said nozzle rod in the vicinity of the nozzle on which material can deposit during a closed cycle of the nozzle is scraped by said support means during movement between closed and opened positions.

3,952,928
MULTI-CHAMBERED TUNDISH TO INDUCE DAMPENED FLOW

Charles Christian Gerding, Pittsburgh, and Louis John Todora, Aliquippa, both of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

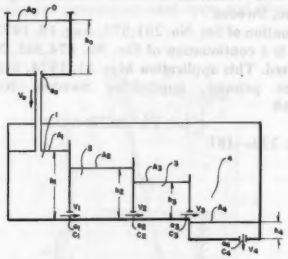
Division of Ser. No. 470,510, May 16, 1974, Pat. No. 3,907,163, which is a division of Ser. No. 324,700, Jan. 18, 1973, Pat. No. 3,831,659. This application May 31, 1975, Ser. No. 579,523
Int. Cl.² B22D 37/00
U.S. Cl. 222—564 **4 Claims**

1. A tundish for dispensing liquid material at a low velocity, comprising:

a. a container capable of holding liquid material having sidewalls attached to a generally sloped bottom;

b. partition means connected to said container bottom and sidewalls for separating said container into at least three chambers, which chambers comprise an initial chamber adapted for receiving and holding the liquid material, an intermediate chamber for holding the liquid material, and a final chamber for holding and dispensing the liquid material;

c. dispensing means connected to the final chamber for dispensing the liquid material; and

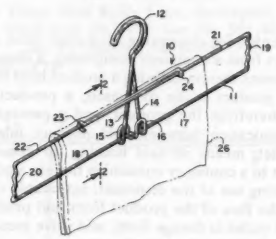


d. orifice means connected to said partition means for providing an interconnection between said chambers so as to permit the liquid metal to flow under the influence of gravity from the initial chamber to an intermediate chamber and from an intermediate chamber to the final chamber.

3,952,929
CLOTHES HANGER AND METHOD FOR THE MANUFACTURE THEREOF

Tibor Horvath, Brooklyn, N.Y., assignor to Abraham Douek, Brooklyn, N.Y., a part interest

Filed July 17, 1974, Ser. No. 489,075
Int. Cl.² A47J 51/11
U.S. Cl. 223—94 **5 Claims**



1. A hanger of a single length of wire formed to expand and grip the waistband of a garment comprising, in combination, a 180° bend in the center of said length of wire forming parallel lengths of wire adjacent to said 180° bend, a hook to secure said hanger to a rack pole formed from said parallel lengths of wire adjacent to said 180° bend, two legs of said wire having lower ends extending downward from said hook and diverging from each other, an upward and inward facing guide loop at the lower end of each of said legs, arms of said wire extending horizontally from said guide loops, each of said arms being slidably supported by the guide loop from which the other of said arms extends, outer ends of said arms being bent upwards to engage the waistband of a garment, said guide loops contacting each other to serve as stops limiting the outward extension of said outer ends of said arms, bars of said wire extending inwards from said upward bent outer ends of said arms, and bar securing hooks at the ends of said bars, said bars overlapping each other, said bar securing hooks of each bar slidably engaging the other of said bars, said bars telescoping as said ends of said bars are compressed, compression of said outer

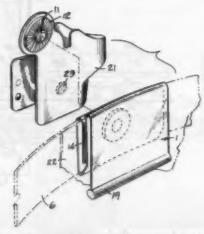
ends of said arms flexing said legs so that said legs urge said arms outward to engage the outer ends of said arms with the waistband of a garment to support it.

3,952,930

BELT ATTACHMENT DEVICE FOR HOLSTER OR THE LIKE

Archie Baldocchi, San Salvador, El Salvador

Filed Jan. 24, 1975, Ser. No. 543,766
Int. Cl.² F41C 33/04
U.S. Cl. 224—2 C 6 Claims



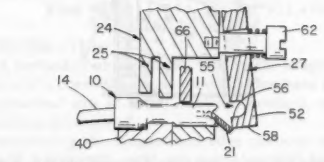
1. A holder attachment attached to a belt and belt supported garment for holding a holster and the like including,
- a saddle of semi-flexible material being of generally U-shaped cross-section,
- an inner saddle side and an outer saddle side being connected by a flexible joint whereby said sides can be pressed over the upper edge of a belt,
- mounting means on the outer saddle side for attachment of the holster thereto,
- releasable adhesive means on the exposed face of the inner saddle side,
- a flexible middle strip portion extending as a continuation of the outer saddle side for encircling the belt,
- an end portion of said strip,
- releasable adhesive means on the inner face of the middle strip portion at such distance from said outer saddle side that when said middle portion is wrapped around said belt it releasably engages said releasable adhesive means on the exposed face of the inner saddle side,
- and a portion between said middle strip portion and the end of said strip having a non-slip surface, wherein said end portion is insertable over the edge of the belt supported garment between the wearer's body and the belt.

3,952,931

INSULATED TERMINAL SEPARATION

Donald R. Weber, Walpole, Mass., assignor to Ark-Les Switch Corporation, Watertown, Mass.

Filed Dec. 6, 1974, Ser. No. 530,199
Int. Cl.² B26F 3/00
U.S. Cl. 225—103 2 Claims



1. Apparatus for separating an assembled insulated wire terminal from a carrier strip segment, the assembled terminal including a metal body having at its rear end wire receiving elements and at its forward end terminal receiving elements, and having an insulated plastic sleeve surrounding the metal body, the forward end being attached to the carrier strip segment at a separation line prescored on both surfaces of the metal and extending generally parallel to the length of the carrier strip and being within the sleeve, comprising
- positioning means to retain the assembled wire terminal in a fixed position,
- said positioning means comprising
- a base defining a feed path for the carrier strip with attached terminals, and retaining means fixed with respect to said base adjacent said base feed path and cooperating therewith to retain an insulated terminal in a fixed position, and
- flexing means to flex the carrier strip segment at the prescored separation line successively in two senses with respect to the wire terminal retained in said fixed position to separate the carrier strip segment from the terminal at the prescored separation line within the sleeve,
- said flexing means comprising a separating tool having a segment-flexing end adjacent said base providing spaced first and second segment-flexing surfaces extending generally parallel to said feed path,
- reciprocating means for reciprocating said separating tool with respect to said base feed path in engagement with the carrier strip,
- connecting means connecting said separating tool and said reciprocating means at a point spaced from said segment-flexing end for motion of said segment-flexing end away from said reciprocating means and generally transverse to said feed path, and
- biasing means for returning said segment-flexing end toward said reciprocating means,
- whereby, as said reciprocating means moves said separating tool toward said base feed path, said separating tool first segment-flexing surface engages the carrier strip segment to flex the segment in a first sense from the pre-scored line and to cam said segment-flexing end into motion away from said reciprocating means and past the segment, said biasing means tending to return said separating tool toward said reciprocating means, and, as said reciprocating means reverses to move said separating tool away from said base feed path, said separating tool second segment-flexing surface engages the segment to flex the segment in a second sense from the pre-scored line to separate the terminal from the segment.

3,952,932

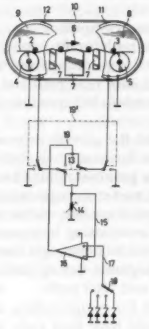
TRANSPORT SYSTEM FOR MAGNETIC TAPE RECORDER AND REPRODUCER SETS, PARTICULARLY FOR CASSETTE MAGNETIC TAPE RECORDERS

O. Hubert Richt, Buchenweg 14, Socking, Germany (8135)

Continuation of Ser. No. 442,166, Feb. 13, 1974, abandoned.
This application May 2, 1975, Ser. No. 573,888
Claims priority, application Germany, Feb. 16, 1973, 2307825
Int. Cl.² B65H 17/20
U.S. Cl. 226—49 10 Claims

1. In a tape transport system for use in a magnetic tape recorder and reproducer set wherein a magnetic tape is simultaneously driven by means of two capstans, the improvement comprising two motors, one of which is associated with one of said capstans, and the other with the other capstan, driving discs connected to said motors, transmission belt means connecting the driving discs of the two motors, means for operating the motor downstream relative to the moving magnetic tape as the driving motor for said tape, electrical circuit means

associatable with said upstream motor for adapting the latter as a tachometer-generator, and means for controlling the rpm



of said downstream motor by applying thereto signals emitted by said tachometer-generator.

3,952,933

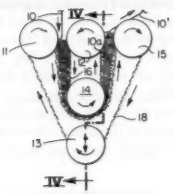
STRAND TREATMENT APPARATUS AND METHOD

Ralph W. List, East Lansdowne; Malcolm F. Irwin, West Chester, and Robert K. Stanley, Media, all of Pa., assignors to Textured Yarn Co., Inc., Kennett Square, Pa.

Filed Apr. 18, 1974, Ser. No. 461,976

Int. Cl.² B65H *17/34*

U.S. Cl. 226—118 **11 Claims**



1. In apparatus for treating textile strands, improved temporary holdup means comprising a pair of conveyor screens with mutually parallel rolls supporting the respective screens; the first screen having a V configuration as viewed edge-on, in the direction of the roll axes, the first screen passing about a first upper roll at one arm extremity of the V, a lower roll at the apex of the V, and a second upper roll at the other arm extremity of the V; the second screen having an I configuration as viewed likewise, the second screen passing about an upper roll and a lower roll, the upper roll of the second screen being located between and spaced from the upper rolls of the first screen, and the lower roll of the second screen being located above and spaced from the lower roll of the first screen; the first screen also being constrained to pass below the lower roll of the second screen and contiguous with the second screen thereat.

3,952,934

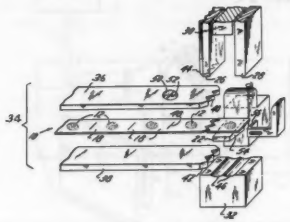
APPARATUS FOR APPLYING DESIGNS TO PIERCEABLE MATERIALS

Irwin Zahn, New York, N.Y., assignor to General Staple Company, Inc., New York, N.Y.

Division of Ser. No. 396,462, Sept. 12, 1973, Pat. No. 3,902,866. This application June 23, 1975, Ser. No. 589,517

Int. Cl.² B27F *7/10*

U.S. Cl. 227—88 **10 Claims**



1. An apparatus for applying designs to pierceable materials from a continuous supply strip containing intermittent design portions equally spaced along the length of said supply strip; said apparatus comprising;

feeding means for intermittently feeding said supply strip to a shearing, bending, driving and clinching station positioned above a clinching die;

shearing means for severing a length of said supply strip from the end thereof;

bending means for bending said length into an approximately U-shaped member having a bight portion and side leg portions;

driving means for driving said U-shaped member into said clinching die and through any pierceable material positioned above said die; and

locater means for establishing a proper start position for said strip so that said design portions will constitute said bight portions of said U-shaped members.

3,952,935

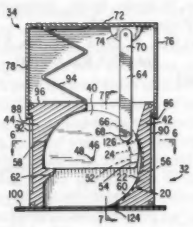
CURVED PIN AND INSERTER

Kenneth B. Erkenbrack, Charlottesville, Va., assignor to New Products, Inc., Charlottesville, Va.

Continuation-in-part of Ser. No. 464,382, April 26, 1974, abandoned. This application Mar. 7, 1975, Ser. No. 556,241

Int. Cl.² B25C *1/02*

U.S. Cl. 227—120 **32 Claims**



1. Apparatus for use in inserting a curved pin into a workpiece, said apparatus comprising:

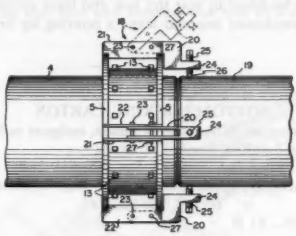
a body, said body defining a circular path for said pin to follow, said path terminating at an opening in said body thru which said pin passes for insertion into said workpiece;

means for supplying said pin to said circular path;
a drive plunger rotatably mounted in said body for engaging said pin to drive said pin along said circular path; and,
means slidably secured to and reciprocatable with respect to said body to drive said plunger along said circular path.

3,952,936
REFORMING PIPE CLAMP

Timothy C. Dearman, 4191 E. Stanley Road, Mt. Morris, Mich. 48458

Filed Oct. 7, 1974, Ser. No. 512,527
Int. Cl.² B23K *37/04*
U.S. Cl. 228—49 **12 Claims**



1. A reforming pipe clamp adapted to encircle a length of pipe adjacent one end thereof, said clamp comprising a rigid annulus having an inside diameter greater than the outside diameter of the pipe to be encircled; a plurality of circumferentially spaced, independent radially adjustable force applying members carried by said annulus for movement radially thereof into and out of forcible engagement with a pipe encircled by said annulus; a plurality of support members adapted to support a second length of pipe in end to end confrontation with a pipe encircled by said annulus; means mounting each of said support members on said annulus for movements relative thereto regardless of whether said force applying members forcibly engage a pipe encircled by said annulus, each of said support members being movable independently of said force applying members from a first position in which said support member extends axially beyond one side of said annulus a distance sufficient to project beyond said one end of a pipe encircled by said annulus and engage a second pipe confronting the encircled pipe, to a second position in which said support member does not extend beyond said one end of the encircled pipe; and means for releasably locking each of said support members in said first position.

3,952,937
METHOD AND APPARATUS FOR ULTRASONICALLY WELDING CONTINUOUS LENGTHS OF METAL STRIP

Robert P. Lamons, Hinsdale, Ill., and James Byron Jones, West Chester, Pa., assignors to Andrew Corporation, Orland Park, Ill.

Filed Nov. 11, 1974, Ser. No. 522,470
Int. Cl.² B23K *1/06*
U.S. Cl. 228—110 **11 Claims**

1. A method of ultrasonically welding the longitudinal edge portions of a continuous metal strip that has been rolled about a longitudinal axis to form a tubular product, said method comprising the steps of

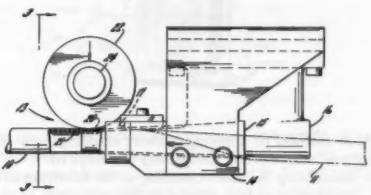
a. supporting the longitudinal edge portions of said strip with a stationary, rigid, non-resonant anvil located inside the rolled metal strip and supported by means extending between the longitudinal edges of the strip upstream of the point where said edges are brought together,

b. continuously advancing the rolled metal strip while slightly overlapping the longitudinal edge portions thereof and passing the overlapped edge portions over said anvil, and

c. continuously engaging the outermost surface of the overlapped edge portions with a non-traversing ultrasonic welding head which presses the overlapped edge portions against said anvil while vibrating at an ultrasonic frequency in a direction transverse to the direction of advancement of the rolled metal strip, said anvil supporting said edge portions along a plurality of spaced parallel strips only, said strips extending in the direction of advancement of the rolled metal strip to minimize friction between the metal strip and the anvil in the machine direction while providing a large amount of friction between the metal strip and the anvil in the direction of vibration of said welding head.

6. Apparatus for ultrasoncially welding the longitudinal edges of a continuous metal strip that has been rolled about a longitudinal axis to form a tubular product, said apparatus comprising the combination of

a. a stationary, rigid, non-resonant anvil supporting the inside longitudinal edge portions of said strip before such



edge portions have been brought together, said anvil being located inside the rolled metal strip and supported by means extending between the longitudinal edge portions of the strip.

b. means for continuously advancing the rolled metal strip while slightly overlapping the longitudinal edge portions thereof and passing the overlapped edge portions over said anvil, and

c. a non-traversing ultrasonic welding head for continuously engaging the outermost surface of the overlapped edge portions and pressing the overlapped edge portions against said anvil while vibrating at an ultrasonic frequency in a direction transverse to the direction of advancement of the rolled metal strip, said anvil supporting the metal strip along a plurality of spaced parallel strips only, said strips extending in the direction of advancement of the metal strip to minimize friction between the metal strip and the anvil in the machine direction while providing a large amount of friction between the metal strip and the anvil in the direction of vibration of said welding head.

3,952,938
METHOD OF MAKING MULTIPLE MEMBER COMPOSITE METAL PRODUCTS

John B. Ulam, McMurray, Pa., assignor to Clad Metals, Inc., Cannonsburg, Pa.

Filed Dec. 10, 1973, Ser. No. 423,253
Int. Cl.² B23K *19/00, 21/00*
U.S. Cl. 228—190 **7 Claims**

1. The method of making a composite metal product characterized by a high rate of thermal transmission and by resistance to corrosion comprising the steps of:

a. mechanically cleaning the surfaces of each of a sheet from the group consisting of copper and copper alloys, a sheet from the group aluminum and aluminum alloys and a sheet of stainless steel;

b. heating said mechanically cleaned sheets to a temperature of about 600° to 800°F;

c. joining said sheets under pressure sufficient to reduce the total thickness of said sheets an amount between 25 to 60% with the aluminum sheet disposed between the copper and stainless steel; and

d. stress relieving the joined sheets to a temperature of about 700°F, to cause diffusion between the metal sheets.

3,952,939

SHEET CLADDING METHOD

William F. Schilling, Schenectady; Adrian M. Beltran, Ballston Lake, and Gerald E. Wasielewski, Rexford, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 28, 1975, Ser. No. 599,630

Int. Cl.² B23K *19/00*

U.S. Cl. 228—193 **9 Claims**

1. A method of applying a sheet cladding to a structural substrate, said method comprising the steps of:

a. assembling the sheet cladding to the substrate so that the cladding closely conforms to the substrate;

b. masking the seams between the cladding and substrate;

c. placing the cladding-substrate assembly into a deformable container;

d. filling the container with a pressure transmitting medium so as to completely immerse the cladding-substrate assembly therein;

e. sealing the container so that it is air-tight;

f. applying hot gas isostatic pressure to the exterior surfaces of the container for diffusion bonding the cladding to the substrate; and,

g. removing the diffusion bonded sheet-cladding assembly from the container.

3,952,940

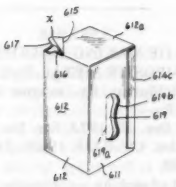
PAPERBOARD CARTONS WITH LIQUID-PROOF LINERS

James A. Malcolm, Downsview, Canada, assignor to Flag Carton Corporation Ltd., Downsview, Canada

Division of Ser. No. 265,964, June 26, 1972, Pat. No. 3,878,771. This application Feb. 24, 1975, Ser. No. 552,567

Int. Cl.² B65D *5/40, 5/70*

U.S. Cl. 229—14 BA **13 Claims**



1. A knocked down container that can be erected into a rectangular box that has a liner and is suitable for holding and dispensing fluid material, comprising a paperboard blank having four rectangular side forming panels, flaps protruding beyond the ends of the panels for closing the ends of the box, a flexible tubular liner arranged flat on the inner surfaces of a pair of adjoining panels and coterminous with the total width of said pair of panels, the liner protruding longitudinally beyond the ends of said pair of panels, a seal closing one end of the liner, the other end of the liner being unsealed, said seal extending widthwise of the liner whereby when the box is erected, said seal extends adjacent one diagonal of one end of the box, areas on the blank being adhesively attached to the liner at locations adjacent the ends of the other diagonal of said box end, the adhesive at said locations being longitudinally spaced from said seal by a distance half the length of said other diagonal whereby when the box is erected the liner will be taut adjacent said other diagonal, and wherein the blank is weakened along a line extending into two adjacent side forming panels and across one of said areas, providing when the box is erected a corner of the box adhered to the liner which corner can be lifted to tear the box and liner simultaneously along the weakened line and leave a pouring lip on the container.

3,952,941

BOTTOM LOCKING CARTON

John Zimmerman, Willowdale, Canada, assignor to Somerville Industries Limited, London, Canada

Filed Oct. 3, 1975, Ser. No. 619,260

Claims priority, application Canada, Dec. 9, 1974, 215702

Int. Cl.² B65D *5/48*

U.S. Cl. 229—41 B **10 Claims**

1. In a lay-flat carton having bottom wall forming side and end panels hingedly connected to side and end panels respectively, the divider panels hingedly connected to each of said bottom wall forming panels and projecting therefrom, the divider panel of each side bottom wall being articulately connected to the divider panel of an adjacent end bottom wall panel whereby upon movement from the lay-flat configuration to the erect configuration, the bottom wall forming panels draw the divider panels into a position dividing the container space into a plurality of compartments, the improvement of slot means opening through one of said divider panels at its hinged connection with respect to a side bottom wall panel, and lug means projecting outwardly from the other of said side bottom wall panels, said lug means mating with said slot means as said container moves to the erect configuration to provide a bottom wall interlock substantially in the plane of the bottom wall resisting a return to the lay-flat configuration.

3,952,942

CONTINUOUS FORM MAILER WITH INTEGRAL DETACHABLE INSERT MATERIAL AND RETURN ENVELOPE

John W. O'Leary, 14 Burncoat Way, Pittsford, N.Y. 14534; Ralph C. Wicker, 218 Williams St., Geneva, N.Y. 14456, and John Lewis Williams, 15 Terrace Villa, Fairport, N.Y. 14450

Continuation of Ser. No. 436,125, Jan. 24, 1974, abandoned. This application May 15, 1975, Ser. No. 577,569

Int. Cl.² B65D *27/10*

U.S. Cl. 229—69 **7 Claims**

1. A continuous form mailer including an invoice, return stub and integral return mailing envelope comprising:

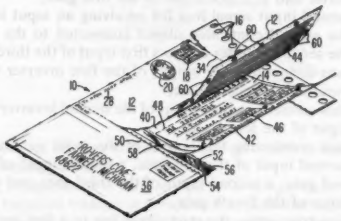
a first continuous upper web of material adapted for receiving intelligible data thereon;

a second continuous lower web of material capable of receiving intelligible data thereon;

means forming a transfer surface for said mailer effective to transfer printed intelligible data applied to said first web through said first upper web to the confronting surface of the adjacent second lower web;

separable tractor hole area means at the side edge of said webs for mounting said first and second continuous webs in substantial parallel confronting alignment while said form is printed;

an upper separation line parallel to said side edge dividing said first continuous upper web into easily separable segments including an easily detachable return area portion on said first web forming one half of a return envelope;



an lower separation line parallel to said upper separation line dividing said second lower web into easily separable segments including an easily detachable return area portion forming the other half of said return envelope;

means bonding said first and second webs together about three edges thereof in the return area portion of said envelope so that both halves of said return envelope are adapted for being formed into a full integral envelope assembly, and means to close and seal the return envelope; and

means bonding said webs together in the remaining confronting non-return areas at a portion of the confronting surface areas thereof, and a transverse separation line on said second web perpendicular to said side edge permitting said invoice and said return stub to be separated

and wherein said upper and lower separation lines dividing said continuous webs into separable segments are offset parallel lines of perforations straddling an area forming said means to close and seal said return envelope.

3,952,943

APPARATUS FOR SWAGING THE MOVEMENT CONTROL BELTS FOR CONTROLLING OPERATING GROUPS OF A KNITTING MACHINE

Michel Patthey, Couvet, Switzerland, assignor to Edouard Dubied et Cie (Societe Anonyme), Couvet, Switzerland

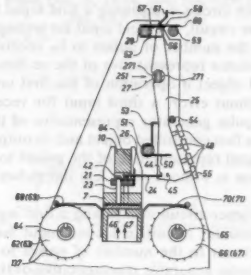
Filed Jan. 10, 1975, Ser. No. 539,988

Claims priority, application Switzerland, Jan. 14, 1974, 444/74

Int. Cl.² G06K *1/02*

U.S. Cl. 234—116 **9 Claims**

1. An apparatus for swaging or punching a movement control belt or tape for the control of the operational groups of a knitting machine, comprising a punching bar, a die, punches, a punch bearing plate, entrainment means, a movement control tape, punch selection means and a selector keyboard, characterized by the fact that for each of the possible perforations arranged over at least one row of a movement control belt there is a punch which is free from any mechanical attachment, that a selector corresponds to each punch which may be pivoted on its axis of rotation into at least two positions which it maintains by memory means constituted by a spring-comb, each tooth of said spring comb acting on at least one of the selectors, that memorized selectors are cancelled individually and/or by operations, each function requiring one or more selectors, and/or totally by cancellation or erasure means which are manual, independent of a swaging cycle, and/or automatic depending on a swaging cycle, that a selection bar corresponds to each selector which materializes the selection, that all, part of, or none of the perforations constituting on a movement control tape, at least one group of functions and arranged on at least one row and over the entire length of the



die and the punch holder, result from one single swaging cycle, that the step by step advance of a movement control belt during one swaging cycle is adjustable by entrainment means in at least two different sizes, that at least one of the entrainment means wheels is movable on a shaft, in at least two different positions allowing for the swaging or punching of at least two types of movement control belts of different widths, and that the posting of the keys making up the selector keyboard is identical for several types of movement control belts.

3,952,944

DEVICE FOR AUTOMATICALLY MONITORING THE OPERATING STATES OF CONTROLLED OBJECTS IN A SEQUENCE CONTROL SYSTEM

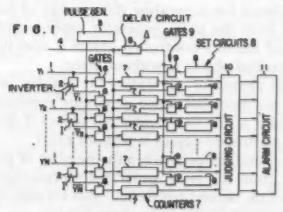
Haruo Koyanagi, Musashimurayama; Iwao Sato, Komae; Buhei Yasuhara; Jiro Sakai, both of Tokyo; Nobuharu Yamauchi, Amagasaki; Masaji Matsumura, Amagasaki, and Katsuhide Morimoto, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo and Nissan Motor Company Limited, both of, Japan

Filed May 21, 1974, Ser. No. 471,983

Claims priority, application Japan, May 22, 1973, 48-57453

Int. Cl.² H03K *21/06*

U.S. Cl. 235—92 CT **1 Claim**



1. A sequence control monitoring system for monitoring the operating states of first and second controlled objects comprising:

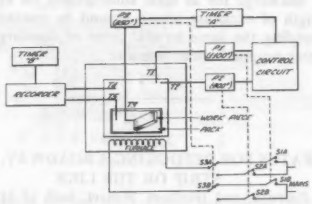
a pulse generator for generating a series of pulses at a predetermined frequency,

a delay circuit having a delay time shorter than one period of the predetermined frequency,
a first inverter,
a second inverter,
a first gate,
a second gate,
a third gate,
a fourth gate,
a fifth gate,
a sixth gate,
a seventh gate,
an eighth gate,
a first counter circuit comprising a first input for resetting the counter circuit, a second input for setting the counter circuit to the number of pulses to be received from the pulse generator representative of the on time of the first controlled object if operation of the first controlled object is without error, a third input for receiving pulses from the pulse generator representative of the actual on time of the first controlled object and an output for generating a signal representative of the pulses to be received if operation is without error less the pulses actually received,
a second counter circuit comprising a first input for resetting the counter circuit, a second input for setting the counter circuit to the number of pulses to be received from the pulse generator representative of the off time of the first controlled object if operation of the first controlled object is without error, a third input for receiving pulses from the pulse generator representative of the actual off time of the first controlled object and an output for generating a signal representative of the pulses to be received if operation is without error less the pulses actually received,
a third counter circuit comprising a first input for resetting the counter circuit, a second input for setting the counter circuit to the number of pulses to be received from the pulse generator representative of the on time of the second controlled object if operation of the second controlled object is without error, a third input for receiving pulses from the pulse generator representative of the actual on time of the second controlled object and an output for generating a signal representative of the pulses to be received if operation is without error less the pulses actually received,
a fourth counter circuit comprising a first input for resetting the counter circuit, a second input for setting the counter circuit to the number of pulses to be received from the pulse generator representative of the off time of the second controlled object if operation of the second controlled object is without error, a third input for receiving pulses from the pulse generator representative of the actual off time of the second controlled object and an output for generating a signal representative of the pulses to be received if operation is without error less the pulses actually received,
a first set circuit for generating the number of pulses to be received from the pulse generator representative of the on time of the first controlled object if operation of the first controlled object is without error,
a second set circuit for generating the number of pulses to be received from the pulse generator representative of the off time of the first controlled object if operation of the first controlled object is without error,
a third set circuit for generating the number of pulses to be received from the pulse generator representative of the on time of the second controlled object if operation of the second controlled object is without error,
a fourth set circuit for generating the number of pulses to be received from the pulse generator representative of the off time of the second controlled object if operation of the second controlled object is without error,
a judging circuit for receiving the output of the first counter circuit and for generating a signal if the output of the first counter circuit is negative, for receiving the output of the second counter circuit and for generating a signal if the output of the second counter circuit is negative, for receiving the output of the third counter circuit and for generating a signal if the output of the third counter circuit is negative and for receiving the output of the fourth counter circuit and for generating a signal if the output of the fourth counter circuit is negative,
an alarm circuit for receiving the signal generated by the judging circuit,
a start signal line for receiving a start signal connected to the input of the delay circuit,
means connecting the output of the delay circuit to the first input of the fifth gate, to the first input of the sixth gate, to the first input of the seventh gate and to the first input of the eighth gate,
an input signal line for receiving an input signal for the first controlled object connected to the input of the first inverter and to a first input of the first gate,
a second input signal line for receiving an input signal for the second controlled object connected to the input of the second inverter and to a first input of the third gate,
means connecting the output of the first inverter to a first input of the second gate,
means connecting the output of the second inverter to a first input of the fourth gate,
means connecting the output of the pulse generator to a second input of the first gate, a second input of the second gate, a second input of the third gate and a second input of the fourth gate,
means connecting the start signal line to a first input of the first counter circuit, to a first input of the second counter circuit, to a first input of the third counter circuit and to a first input of the fourth counter circuit,
means connecting the output of the first gate to a third input of the first counter circuit,
means connecting the output of the second gate to a third input of the second counter circuit,
means connecting the output of the third gate to a third input of the third counter circuit,
means connecting the output of the fourth gate to a third input of the fourth counter circuit,
means connecting the output of the first set circuit to a second input of the fifth gate,
means connecting the output of the second set circuit to a second input of the sixth gate,
means connecting the output of the third set circuit to a second input of the seventh gate,
means connecting the output of the fourth set circuit to a second input of the eighth gate,
means connecting the output of the fifth gate to a second input of the first counter circuit,
means connecting the output of the sixth gate to a second input of the second counter circuit,
means connecting the output of the seventh gate to a second input of the third counter circuit,
means connecting the output of the eighth gate to a second input of the fourth counter circuit,
means connecting the output of the first counter circuit to the judging circuit,
means connecting the output of the second counter circuit to the judging circuit,
means connecting the output of the third counter circuit to the judging circuit,
means connecting the output of the fourth counter circuit to the judging circuit,
means connecting a first output of the judging circuit to a first input of the alarm circuit,
means connecting a second output of the judging circuit to a second input of the alarm circuit,
means connecting a third output of the judging circuit to a third input of the alarm circuit,
means connecting a fourth output of the judging circuit to a fourth input of the alarm circuit.

3,952,945
FURNACE TEMPERATURE CONTROL SYSTEM

Richard Hampton Biddulph, Worcester Park, England, assignor to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Nov. 18, 1974, Ser. No. 524,839
Claims priority, application United Kingdom, Nov. 16, 1973, 53278/73
Int. Cl.² G05D *23/22*; F23N *1/00*
U.S. Cl. 236—15 B **5 Claims**



1. A furnace heating and control system which comprises a furnace heating means;

a first temperature controller, set to a temperature above the required treatment temperature, and connected to a first means for measuring the temperature of the furnace atmosphere, and to the heating means;

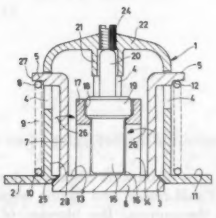
a second temperature controller, set to a temperature below the required treatment temperature, and connected to a means for measuring the temperature of an article being treated and via a timing mechanism and a change-over relay, adapted to change control of the heating means from the first temperature controller to a third temperature controller, to the heating means; and

a third temperature controller, set to the required treatment temperature, and connected to a second means, for measuring the temperature of the furnace atmosphere, and to the heating means.

3,952,946
THERMOSTATIC VALVE

Bernhard W. Braukmann, Am Rosenberg 1, 6950 Mosbach, Germany

Filed July 12, 1974, Ser. No. 488,153
Int. Cl.² F01P *7/02*
U.S. Cl. 236—34 **5 Claims**

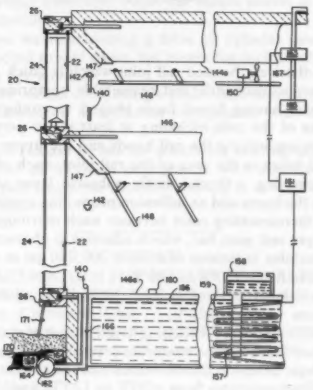


1. A thermostatic valve for use with heat engines employing a fluid circulating medium having a housing with opposed openings formed therethrough, a valve seat forming a further opening to said housing, spring means surrounding said housing, a valve plate positioned for abutment against and retraction from said seat, said valve plate supporting a thermostatically operable element which bears against the inside surface of said housing to activate said valve plate, a plurality of elastic bending arms to said valve plate, said arms being assembled from within said housing to protrude through said opposed openings and ends on said arms to form support members for one end of said spring means and outwardly formed flank members to said housing to support the other end of said spring means.

3,952,947
HEATING AND VENTILATION SYSTEM

Norman B. Saunders, 15 Ellis Road, Weston, Mass. 02193

Filed Dec. 3, 1974, Ser. No. 529,235
Int. Cl.² F24J *3/02*
U.S. Cl. 237—1 A **28 Claims**



1. A system for controlling the temperature, ventilation, illumination and humidity within an enclosed building having at least one wall exposed to solar radiation comprising:

a double glazed window transmissive to light and sun energy mounted on said wall of said building;

means for measuring the net heat energy flow through said window;

means for automatically adjusting the heat energy flow through said window responsively to the measurement of said net heat energy flow;

means provided in said building for absorbing at least a portion of said light and sun energy transmitted by said window;

a heat sink thermally coupled to said building for storing and delaying some of said portion of light and sun energy so that said means provided in said building for absorbing said portion of energy can release energy when the interior temperature of said building drops; and

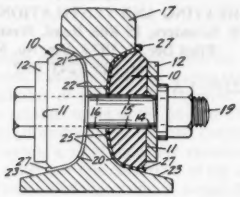
means for circulating exterior air through said building and including means for passing at least a portion of said air between the panes of said double glazed window and thence into said building so as to heat said portion of air with heat energy as the latter passes through said window, and also including means for changing the temperature and relative humidity of another portion of said air by passing said another portion of air through the ground in the area of said building prior to introducing said another portion of air into said building.

3,952,948

ADHESIVELY BONDED RAIL JOINT

Alfred Dwayne Nelson, Stillwater, and Garold L. Goken, Birchwood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 255,613, May 22, 1972, Pat. No. 3,837,948. This application Feb. 19, 1974, Ser. No. 443,369
Int. Cl.² E01B 11/00
U.S. Cl. 238—243 7 Claims



1. Adhesively bonded rail joint which is quick to assemble and easy to dismantle and reassemble comprising a pair of joint bars having broad faces shaped to conform to broad surfaces of the rails including at least major portions of the surfaces underlying the rail heads and the upper surfaces of the rail bases in the area of the rail joint, each of said broad faces carrying a thermoplastic adhesive layer about 10–60 mils in thickness and an adhesion-promoting coating of in-situ cured thermosetting resin between each thermoplastic adhesive layer and joint bar, which adhesive is characterized by:

a. modulus in tension of at least 200,000 psi at all temperatures from −20°F to 120°F,

b. tensile strength of at least 2000 psi at all temperatures from −20°F to 120°F,

c. sufficiently low softening point that it wets steel at less than 500°F under moderate pressure,

d. shear adhesion to cold rolled steel of at least 2000 psi at all temperatures from −20°F to 120°F, and

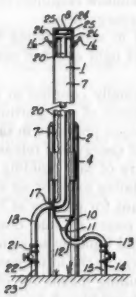
e. water absorption of less than 1 percent after 24-hour immersion.

3,952,949

METHOD OF MAKING SNOW

Herman K. Dupre, c/o Seven Springs, Champion, Pa. 15622

Division of Ser. No. 386,528, Aug. 8, 1973, Pat. No. 3,822,825. This application June 26, 1974, Ser. No. 483,237
The portion of the term of this patent subsequent to July 9, 1991, has been disclaimed.
Int. Cl.² F25C 3/04
U.S. Cl. 239—2 S 5 Claims



1. A method of making snow comprising the steps of:

supplying water under pressure to a point of discharge above ground;

discharging the supplied water through a nozzle into the ambient atmosphere in the form of a spray of discreet water particles when the atmosphere has a temperature lower than the freezing point of water;

independently supplying air under pressure to a second point of discharge above ground;

discharging the supplied air under pressure into the ambient atmosphere in the form of a jet directed into the throat of said sprayed water to produce snow; and

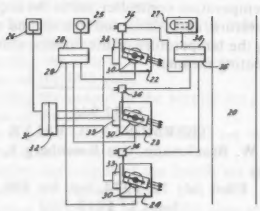
continually insulating said air supplied to said second point of discharge for at least substantially its entire supply length of exposure above ground by coextensively surrounding the same to said point of discharge with said water supplied under pressure.

3,952,950

APPARATUS FOR DEFOGGING A ROADWAY, LANDING STRIP OR THE LIKE

Anton Pocrnja, and Heribert Wenzel, both of Munich, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Division of Ser. No. 485,000, July 1, 1974, abandoned, which is a division of Ser. No. 360,909, May 16, 1973, Pat. No. 3,851,822. This application May 9, 1975, Ser. No. 576,116
Claims priority, application Germany, May 19, 1972, 2224657; May 19, 1972, 2224671; May 19, 1972, 2224672
Int. Cl.² A01G 15/00; E01H 13/00
U.S. Cl. 239—14 22 Claims



1. An apparatus for the defogging of an elongated region, comprising:

a respective row of blowers disposed along each longitudinal side of said region and having respective jets trained generally thereacross, the blowers of each row being oriented at progressively increasing angles away from a central blower of the respective row;

means for dehumidifying the air fed through at least some of said blowers;

a wind-direction detector responsive to the wind direction in said region; and

control means responsive to said detector for orienting the blowers of said rows in dependence upon the wind direction with the central blower of each row generally parallel to the wind direction.

3,952,951

APPARATUS FOR ELECTROSTATICALLY COATING OBJECTS WITH LIQUID, SOLID IN LIQUID, AND/OR POWDER-LIKE MATERIAL

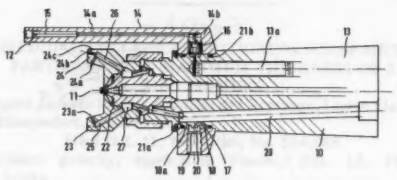
Dieter Raetz, Neckarweihingen, and Fred Luderer, Weiler zum Stein, both of Germany, assignors to Firma Ernst Mueller K.G., Winnenden, Germany

Filed Mar. 3, 1975, Ser. No. 554,495

Claims priority, application Germany, Mar. 13, 1974, 2412131

Int. Cl.² B05B 5/02, 1/28

U.S. Cl. 239—15 2 Claims



1. Apparatus for the electrostatic coating of objects, said apparatus comprising:

gun barrel means

atomizer nozzle means;

supply means operable to supply coating material to said atomizer nozzle means;

electrode means operable to charge a spray of dispersed material issuing from said atomizer nozzle means;

high voltage source means operable to charge said electrode means;

body means supporting said electrode means in spaced relation relative to said nozzle means;

blowing nozzle means operable to direct a flow of anti-fouling air into anti-fouling cooperation with said electrode means;

opposed jetting means operable to flatten a flow of material issuing from said atomizer nozzle means;

air supply means operable to transmit air to said jetting means; and

means including said air supply means, for diverting air supplied to one of said jetting means to said blowing nozzle means.

3,952,952

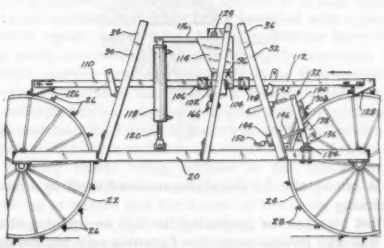
BRAKE MEANS FOR AN AIR-POWERED SPRINKLER SYSTEM

Loren R. Townsend, Sidney, Nebr. 69162

Filed Jan. 10, 1975, Ser. No. 540,111

Int. Cl.² B05B 3/12

U.S. Cl. 239—177 11 Claims



1. A self-propelled sprinkling apparatus comprising,

a water supply pipe moveable about a central pivot point,

a plurality of spaced apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled,

an air operated drive means on each of said towers to propel said towers and said supply pipe about said central pivot point,

a source of compressed air for supplying air under pressure to said drive means,

control means on said towers for controlling the operation of said drive means so that said towers will be selectively driven to maintain said supply pipe in an aligned condition as said supply pipe is moved about said pivot point,

each of said drive towers comprising at least a pair of wheels,

and a brake means on at least one of said towers which selectively moves into braking engagement with at least one of said wheels on said one tower to prevent the said tower from undesirable rolling,

said tower comprising a frame means having the said pair of wheels mounted thereon,

a trojan bar means reciprocatably mounted on said frame means and moveable between first and second positions for engagement with at least one of said wheels for driving said wheel when said trojan bar means moves in at least one direction,

said drive means including a drive air cylinder operatively connected to said trojan bar means for reciprocating said trojan bar means,

said brake means comprising a brake shoe normally yieldably maintained in frictional engagement with said one wheel,

and brake release means for selectively moving said brake shoe out of frictional engagement with said one wheel when said trojan bar means is moving in at least said one direction.

3,952,953

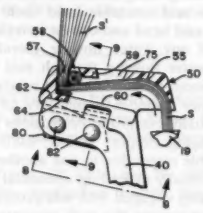
REACTION ARM FOR ROTARY SPRINKLER

Ralph H. Eby, Cincinnati, Ohio, assignor to John S. Greeno Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 479,857, June 17, 1974. This application May 5, 1975, Ser. No. 574,536

Int. Cl.² B05B 3/02

U.S. Cl. 239—230 8 Claims



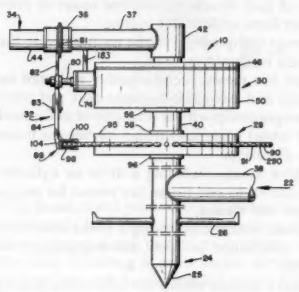
1. A reaction arm for a rotary sprinkler comprising a support portion having a head-supporting shoe on one end and a counterweight on the other end and defining a pivot portion therebetween, a spray deflecting reaction head mounted on said shoe, said head having a pair of side walls in spaced relation defining a rear opening at the side thereof facing said shoe, means on said head defining a front opening, said head having a front wall extended between said side walls opposite said rear opening to receive a water stream from the sprinkler through said rear opening to turn said stream therethrough substantially at a right angle to its original direction of flow, said head further having a transversely opposite wall extended between said side walls to receive said stream after it leaves said front wall and to direct the same through said front opening in a direction which is in converging relation with that of said water stream entering said head, said support portion and said head being injection molded of plastic resin material, said shoe fitting between said side walls, and said head being connected to said shoe at said side walls such that said rear opening is partially closed and a transverse flow passage leading

from said front wall to said transversely opposite wall is defined by said shoe and said front wall in combination with said side walls.

3,952,954
AUTOMATIC WATER SPRINKLER FOR IRREGULAR AREAS

Robert E. Taylor, 309 SW. 11th St., Andrews, Tex. 79714

Filed Feb. 28, 1975, Ser. No. 553,906
Int. Cl.² B05B *3/08*
U.S. Cl. 239—236 **6 Claims**



1. An automatic sprinkler for watering irregular areas comprising:

a ground engaging support means, a programmer having means by which data can be stored therein related to a geometrical configuration of an irregular area, a nozzle assembly, means forming a flow path by which water flows to said nozzle, means forming a rotatable head having a speed control associated therewith by which the rate of rotation of said head is controlled;

means mounting said rotatable head to said support means, means mounting said nozzle in swiveled relationship respective to said rotatable head such that said nozzle rotates with said head and can be swiveled to change the trajectory of any water flowing therefrom; means by which any water flowing through said nozzle tends to impart rotational motion into said rotatable head;

said programmer includes a plurality of radially spaced circumferentially extending protrusions mounted to said ground engaging support means, each said protrusion being bendable respective to one another to jointly form a circumferentially extending sinusoidal pattern;

a follower slidably engaged with said protrusions so that the follower must assume the path presented by a marginal outer peripheral area of said protrusions when said follower is moved relative to said programmer; means connecting said follower to said nozzle and to said speed controller in a manner such that movement of the follower along the sinusoidal path of the programmer causes the speed controller to change the rate of rotation of the head while the follower simultaneously swivels the nozzle to change the trajectory of water issuing therefrom.

3,952,955
SAFETY TIP GUARD

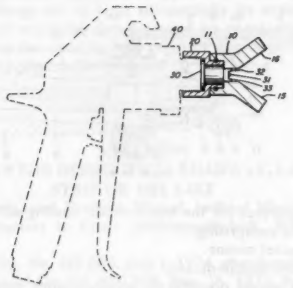
William Clements, St. Louis Park, Minn., assignor to Graco Inc., Minneapolis, Minn.

Filed Dec. 12, 1974, Ser. No. 532,021
Int. Cl.² B05B *1/04*
U.S. Cl. 239—288.5 **3 Claims**

1. A safety guard apparatus for use in conjunction with an airless paint spray gun and spray tip, comprising:

a. a tip retainer nut sized and threaded to secure said spray tip against said spray gun with said spray tip protruding therethrough, said tip retainer nut having a forward circumferential flat surface with a circumferential groove therein;

b. a safety guard having forwardly projecting ears and a rearward cylindrical portion sized to fit over said tip retainer nut circumferential flat surface, said cylindrical portion having an inner circumferential groove in substantial alignment with said tip retainer nut circumferential groove when said rearward cylindrical portion is fitted over said circumferential flat surface, said safety guard having an internal slotted opening mated to accept said



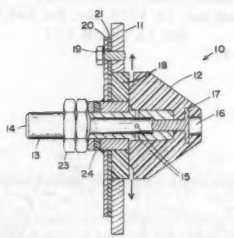
spray tip in keyed alignment therewith, said safety guard having a narrow slotted region, of width less than one-half inch, intermediate said forwardly projecting ears and opening said spray tip forwardly through said safety guard, and said ears each comprising a member shaped for outward divergence from the axis of said spray gun in the forward direction, said member having an inner beveled surface joining said narrow slotted region; and

c. a compressible spring clip held in compressed relation within both said tip retainer circumferential groove and said cylindrical portion inner circumferential groove.

3,952,956
BIN AERATOR

James R. Steele, Stillwater, Minn., assignor to Dynamic Air Inc., St. Paul, Minn.

Filed Mar. 31, 1975, Ser. No. 563,717
Int. Cl.² B05B *15/00*, *1/30*; B08B *3/02*
U.S. Cl. 239—289 **4 Claims**



1. A bin aerator for dislodging material stuck to a bin wall comprising:

a first member for projecting through an opening in a bin wall and having means for fastening said bin aerator to said bin wall; and a fastening member for attachment to said first member;

a pliable body member for mounting inside a bin, said pliable body member having a surface for the discharge of air, a second member having a surface for the discharge

of air and said pliable body member and said second member having a central opening therein for receiving said first member and said fastening member; said surface on said pliable body member and said surface on said second member located in pressure contact by the coaction of said fastening member and said first member;

means for suppying air to the surface on said pliable body member and the surface on said second member to thereby cause said pliable member to flex and bend as air is discharged over said surface on said pliable body member to thereby dislodge any material lodged on said bin wall.

3,952,957

SHREDDING UNIT FOR CONDITIONING SCRAP METAL PARTS HAVING A MAXIMUM THICKNESS OF 5 MILLIMETERS

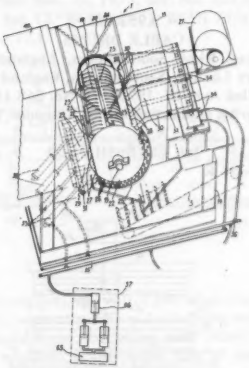
Edgard Jacques Maillet, Chateau de l'Ermitage, Ludon Medoc, Blanquefort, France (33290)

Filed Oct. 11, 1974, Ser. No. 514,085

Claims priority, application France, Oct. 15, 1973, 73.36684

Int. Cl.² B02C *13/06, 13/31*

U.S. Cl. 241—73 **10 Claims**



1. A shredding unit for conditioning thin scrap metal parts from motor vehicle wrecks or other metallic carcasses, said unit being intended to be placed directly after a supply unit at the inlet of a continuous conversion chain comprising conventional dust extraction equipment as well as screening and magnetic sorting equipment, and essentially constituted by a drum rotatably mounted on a substantially horizontal shaft extending transversely within the interior of a cage having a front feed opening, said drum being provided with a plurality of knives rigidly mounted on the circumference thereof and being partly surrounded over approximately two-thirds of its periphery starting from the threshold of the feed opening by an evacuation grid in the form of a wearing plate provided with calibrated holes, wherein an aligned array of substantially juxtaposed backing knives is placed at each end of the grid opposite to the drum and over the entire length of said drum, said backing knives being adapted in the active position thereof to project inwards with respect to the grid in such a manner as to ensure that the knives of the drum pass in the immediate proximity of said backing knives, said backing knives being each mounted at the extremity of a pivotal support plate in such a manner as to permit a movement of withdrawal under the pressure of an excessively large mass in opposition to an elastic means having a predetermined and substantially constant force which urges each backing knife to said active position.

3,952,958

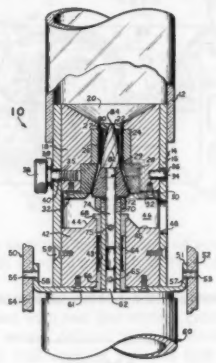
GRINDER APPARATUS FOR WHEAT, GRAINS, AND THE LIKE

Dennis E. Rich, 3810 W. Cholla, Phoenix, Ariz. 85029

Filed Apr. 7, 1975, Ser. No. 565,785

Int. Cl.² B02C *9/04*

U.S. Cl. 241—162 **10 Claims**



1. Grinder apparatus, comprising, in combination:

a cutter adjacent the hopper means, including

a cylindrical bore extending axially through the cutter,

a helical cutting groove in the bore, and

slot means extending axially in the bore through the groove;

first grinding means having a conical grinding surface disposed in the cylindrical bore of the cutter and movable relative to the cutter;

fixed grinding means disposed adjacent the cutter and having a conical shaped interior grinding surface; and

a second grinding means having a conical grinding surface disposed in the fixed grinding means and movable relative to the fixed grinding means.

3,952,959

TEXTILE YARN PROCESSING

Jack Shaw, Read, near Burnley, and Robert Lane, Accrington, both of England, assignors to Platt International Limited, England

Filed Aug. 20, 1974, Ser. No. 498,922

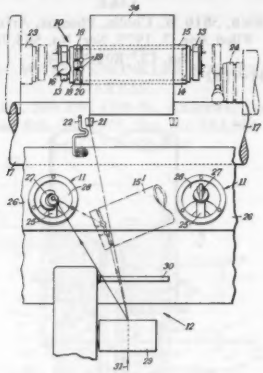
Claims priority, application United Kingdom, Aug. 23, 1973, 40055/73

Int. Cl.² B65H *54/02*

U.S. Cl. 242—18 PW **7 Claims**

1. In a yarn processing machine having yarn collection means, a bobbin tube provided with first and second slots angularly spaced around the periphery and extending from one end thereof, support means for said bobbin tube comprising a pair of spigot members, each member being adapted for supporting the bobbin tube at a respective end, the spigot member supporting the bobbin tube at said one end projecting into the bobbin tube by a distance less than the distance that the first and second slots extend from the said one end such that when the bobbin tube is placed on the supports a first passage is provided between the first slot and the spigot member and a second passage is provided between the second slot and the spigot member, a method of winding yarn on an empty bobbin tube comprises the steps of delivering a running yarn to the yarn collection means through the first and second passages, before placing the bobbin tube on the support means passing the yarn to the inside of the bobbin tube through the first slot and exiting the yarn from the inside of the tube through the second slot, thereafter placing the bobbin tube on

the spigot members while allowing the yarn to continue to run to the yarn collection means through the first and second



passages and rotating the bobbin tube to wind the running yarn thereon.

3,952,960

WINDING MACHINE EQUIPPED WITH A TRAVERSE MECHANISM

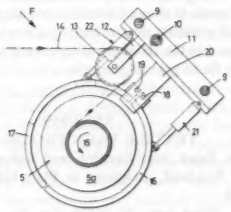
Louis Veyrassat, Rolle, Switzerland, assignor to Maillefer S.A., Switzerland

Filed Oct. 22, 1974, Ser. No. 517,024

Claims priority, application Switzerland, Oct. 26, 1973, 15104/73

Int. Cl.² B65H *67/04*

U.S. Cl. 242—25 A **6 Claims**



1. A winding machine equipped with a traverse mechanism comprising a carriage borne by a support, said carriage being reciprocatingly movable along the entire length of a reel and carrying a pulley for guiding wire being wound on said reel, a circular protective channel coaxial with said reel and borne by said carriage so as to move reciprocatingly with said carriage, said channel including at least one circular track portion extending in a plane parallel to and laterally offset with respect to that of the pulley, and a deflection portion situated in the same plane as the pulley and limited by a deflection wall.

3,952,961

STRAP DISPENSING METHOD AND APPARATUS

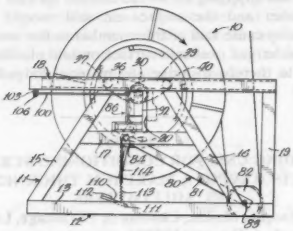
Robert F. Antepenko, Northlake, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Mar. 11, 1974, Ser. No. 449,924

Int. Cl.² B65H *75/32, 17/52*

U.S. Cl. 242—54 R **34 Claims**

6. A strap dispenser comprising: frame means; a hub having a coil of strap thereon; means mounting said hub on said frame means for movement between an elevated rest position and a lowered strap feeding position; latch means for retaining said hub in said rest position; strap sensing means for releasing said latch means in response to demand for strap and enabling said hub to fall toward said strap feeding position; means for accelerating said hub in response to the falling movement thereof; said strap sensing means re-engaging said latch means in the absence of demand for strap, whereby the rotational energy of said hub lifts the same from said strap feeding position to said rest position.



3,952,962

CABLE DRUMS

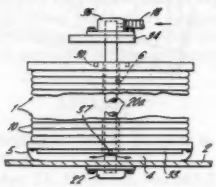
Patrick Michael Kidd, Southampton, England, assignor to Mackley-Ace Limited, Southampton, England

Filed Apr. 15, 1975, Ser. No. 568,182

Claims priority, application United Kingdom, July 20, 1974, 32268/74

Int. Cl.² B65H *75/00*

U.S. Cl. 242—54 R **8 Claims**



1. A cable drum penetrated from end to end by a central hole, and provided with means for supporting the drum in an up-ended position on a cushion of pressurised fluid, said means comprising a flexible skirt of annular form disposed around the periphery of what, in use, is the lower end of the drum so as to define a cushion space, whereby pressurised fluid can be supplied to said cushion space by way of the said central hole so as to support said drum.

3,952,963

CYLINDRICAL WINDING CORE FOR CARRYING A ROLL OF ELONGATED WINDABLE MATERIAL

Niro Ueno, and Ippei Shiraishi, both of Tokyo, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated and Topacs, Incorporation, both of Tokyo, Japan

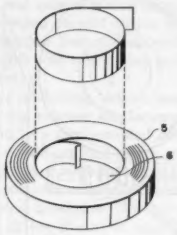
Filed Oct. 4, 1974, Ser. No. 512,144

Int. Cl.² B65H *17/02*

U.S. Cl. 242—68.5 **9 Claims**

1. A winding core for supporting thereon a wound length of an elongated material, said core having a cylindrical body formed by rolling a strip of resilient material into a cylindrical shape and securing one end of said resilient strip to a point spaced from the opposite end to leave the portion of said strip between said point of securement and said opposite end ex-

tending essentially on a tangent to said cylindrical body as a free convolute portion, whereby said convolute portion is



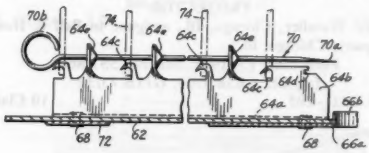
stressed by the winding of elongated material about said core to provide an outward bias against the wound material.

3,952,964

PACKAGES FOR PILE FABRICS

Frederic R. Arden, Salem, N.H., assignor to Malden Mills, Inc., Lawrence, Mass.

Filed Nov. 15, 1974, Ser. No. 524,135
Int. Cl.² B65D 85/67; B65H 75/02
U.S. Cl. 242—77.1 44 Claims



1. A reel for supporting a roll of pile fabric comprising a pair of end panels, separator means for holding said pair of end panels separated from and facing each other, a plurality of radial strips mounted on the inner face of each end panel, each of said radial strips including therealong a plurality of hooks integral with said strip for gripping a fabric edge and a substantially equal number of eyelets integral with said strip, said eyelets being arranged so that all adjacent layers of a rolled fabric secured to the hooks on each radial strip are separated by an eyelet, and means threaded through the eyelets on each radial strip and the fabric layers therebetween for securing said fabric layers in place even if a fabric edge is torn off from a hook.

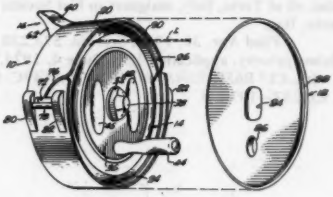
3,952,965

HAND LINE REEL

Pedro F. Falcon, 45 W. 46th Ave., Miami, Fla. 33127

Substitute for Ser. No. 152,214, June 11, 1971, abandoned.
This application Dec. 11, 1974, Ser. No. 531,740
Int. Cl.² B65H 75/40, 17/44
U.S. Cl. 242—96 7 Claims

1. A hand line reel comprising:
A. a housing providing,
1. an annular wall forming an inner annular cylindrical chamber, having an open mouth at one end,
2. a closure wall across the end opposed to said open mouth,
3. a fixed stub shaft extending axially into said annular chamber from said closure wall;
B. a spool rotatably mounted on said stub shaft within said annular chamber, said spool providing,
1. an annular, peripheral line storage groove,
2. an inner face,
3. an outer face,
4. a handle fixed relative to said outer face and extending outwardly through said mouth for manual actuation to impart rotational movement to said spool;
C. a fixed hand grip extending outwardly from said closure wall;



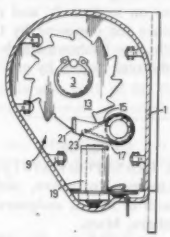
D. a manually operated brake means adjacent to said hand grip to apply selected amounts of friction forces to said inner face;
E. transverse slot means through said annular wall in general alignment with said line storage groove;
F. access slot means defined by space between said spool and annular wall opening between said transverse slot means and said open mouth.

3,952,966

SEAT BELT STORAGE REEL WITH ELECTRICALLY OPERATED LOCKING DEVICE

David William Burleigh, Yateley, England, assignor to Britax (London) Limited, Byfleet, England

Filed May 3, 1974, Ser. No. 466,795
Claims priority, application United Kingdom, May 4, 1973, 21290/73
Int. Cl.² B65H 75/48; H01H 3/16
U.S. Cl. 242—107.4 R 17 Claims



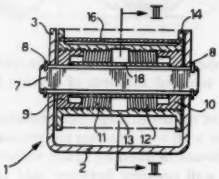
1. An electrically operated safety belt storage reel including a spindle on which a length of safety belt webbing is adapted to be wound, the reel being of the type which is for fitting in a vehicle and the webbing of which may be increased or decreased in length by pulling on the webbing to unwind it from the spindle, thereby allowing movement of the person wearing the belt during normal operating conditions of the vehicle, biasing means biasing the spindle so as normally to wind in a length of webbing mounted on the spindle, locking means normally locking the spindle so that when the locking means is in locking position rotation of the spindle is prevented thereby preventing unwinding of the webbing from the spindle, electrical means associated with the locking means for generating a magnetic field under the influence of which the locking means is moved between locking and unlocking positions, dependent upon a supply of electrical energy to the electrical means, and non-magnetic barrier means associated

with the locking means for minimizing remanence in the locking means subsequent to the supply of electrical energy to the electrical means.

3,952,967
ENERGY DISSIPATOR FOR MOTOR VEHICLE SAFETY BELTS

Mario Barile; Francesco Canavesi, and Pier Vincenzo Franchini, all of Turin, Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Apr. 30, 1975, Ser. No. 573,230
Claims priority, application Italy, June 4, 1974, 68751/74
Int. Cl.² B65H *75/48*; B60R *21/10*; A47C *31/00*
U.S. Cl. 242—107.4 R **4 Claims**



1. Energy dissipator for motor vehicle safety belts, comprising a support adapted to be mounted at a vehicle anchorage point, a flanged reel on which the safety belt is wound in use of the dissipator and means for anchoring one end of the belt to the reel, wherein the improvement consists in the combination of two axially extending seatings at opposite ends of the reel, said seatings being screw-threaded with equal helical pitches of opposite directions, two correspondingly threaded bushes engaged with said threaded seatings, a shaft carried by the support, the bushes being mounted for axial sliding movement without rotation on said shaft, and means interposed between the two bushes for opposing by the dissipation of energy movement of the two bushes towards each other in the event of rotation of the reel caused by unwinding of the belt therefrom.

3,952,968
TAPE TRANSPORT SYSTEM

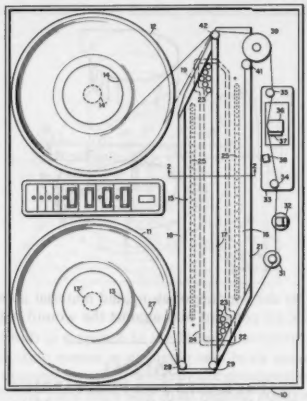
Richard Bruce McKinstry, Northboro, and Joseph Charles Godbout, Acton, both of Mass., assignors to Data General Corporation, Southboro, Mass.

Filed Apr. 10, 1974, Ser. No. 459,816
Int. Cl.² G11B *15/58, 23/12*
U.S. Cl. 242—182 **9 Claims**

1. In a digital magnetic tape transport having a pair of adjacent vacuum storage column means extending lengthwise in a first direction each with oppositely disposed closed and open ends, a magnetic head assembly defining a substantially linear tape threading path along one side of said vacuum storage column means and substantially parallel to the lengthwise direction thereof, a pair of tape reels adapted to be mounted at a second opposite side of said vacuum storage column means along a line parallel with said linear tape threading path, the improvement comprising:

a tapered vacuum column means closed end adjacent the storage reel and along the path traveled by the tape between the storage reel and one of said vacuum columns, the angle of taper being such that the tapered end if extended would not intersect said adjacent storage reel, and

wherein said second vacuum column means closed end is similarly tapered at an angle substantially parallel with

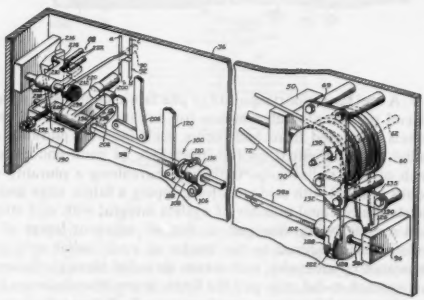


the tapered angle at said first vacuum column means closed end.

3,952,969
DRIVE CONTROL MECHANISM FOR MOTION PICTURE PROJECTOR

James G. Woodier, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Mar. 13, 1975, Ser. No. 557,862
Int. Cl.² G03B *1/04*; G11B *15/32*
U.S. Cl. 242—205 **10 Claims**



1. In a motion picture projector having means to project a motion picture film at a projection station and means to transport film from a supply means through the projection station to a take-up means, the projector including a control means adjustable to a plurality of positions for conditioning the operation of the projector to a plurality of operational modes, the improvement in the control means comprising:

a shiftable member manually actuatable between a plurality of positions;

a control shaft coupled with said shiftable member and being movable axially and rotationally responsive to positioning of said shiftable member;

a shuttle retractor and reverse control member operable by said control shaft;

a dual cam fixed on said control shaft for axial and rotational positioning responsive to adjustment of said shaft;

a plural clutch device actuated by said dual cam for controlling respectively a first output means and a second output means;

cam follower means coupling said cams to said clutch devices for actuating a respective one of said clutch devices to free condition, slip condition, and positive drive condition;

a shaft supporting said output means for rotation thereon;

keying portions provided on said output means;

keying members on said first and second clutch devices being in engagement with said keying portions for driving of said output means;

said clutch devices including driven means and driver means arranged for relative displacement from a non-coupled condition to a semi-coupled condition and to a positive coupled condition, said driven means being non-responsive to said driver means when in said non-coupled condition, being partially responsive to said driver means in said slip coupled condition, and being positively responsive to said driver means in said positive coupled condition; and

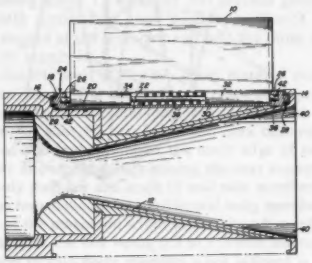
said output means driving said supply means and said take-up means and being drivable respectively by said driven portions of said clutch means.

3,952,970

MEANS FOR IMPROVING ROCKET MISSILE ACCURACY

Casimir T. Orzechowski, Kensington, and Nat Seiden, Brandywine, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 28, 1974, Ser. No. 501,307
Int. Cl.² F42B *13/32*
U.S. Cl. 244—3.23 **13 Claims**



1. Means for improving the ballistic accuracy of a rocket missile which has a nozzle at the aft end formed with a narrower mid-section than its end sections, the end sections which project above said mid-section being formed each with a circular slot therein, the slots facing each other, said system comprising, in combination:

a plurality of fin means for guiding and stabilizing the flight of said missile, said fin means being of the wrap-around type;

biasing means for erecting said fin means when said fin means are clear of a missile launcher tube;

freely rotating runner means for mounting said fin means on said missile, said runner means being a spool-like member fitting around said mid-section of said nozzle and being free to rotate relative to said missile, said fin means rotating with said runner means, and said spool-like member having a circular flange at each end, the outer end of each flange being formed with a circular neck ring; and

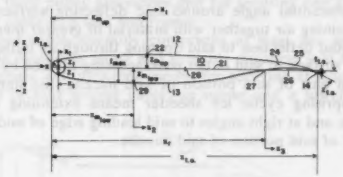
a pair of circular bearings each of which fits securely into a different one of said circular slots in said end sections and each of which is formed with a corresponding circular slot therein, each said neck ring fitting into a different one of said circular slots in said bearings.

3,952,971

AIRFOIL SHAPE FOR FLIGHT AT SUBSONIC SPEEDS

Richard T. Whitcomb, Hampton, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 9, 1971, Ser. No. 197,183
Int. Cl.² B64C *3/10*
U.S. Cl. 244—35 R **20 Claims**



16. An airfoil designed to operate at a Mach number greater than the critical Mach number without boundary layer separation due to shock wave formation comprising:

an airfoil means, said airfoil means having an upper surface means including a first region means extending rearward from a near a leading edge station past a midchord station, said first region means for maintaining a supersonic flow and an approximately constant supersonic velocity over said first region means;

a second region means extending rearward from said first region means, said second region means for producing a drop in velocity from the supersonic velocity over said first region means to a near-sonic velocity, whereby a weak shock wave is formed over said second region means;

a third region means extending rearward from said second region means, said third region means for maintaining the near-sonic velocity produced by said second region means at an approximately constant value;

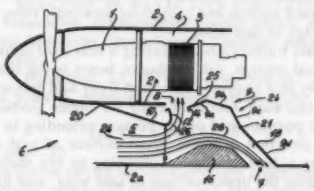
whereby shock wave energy is not sufficiently strong to cause boundary layer separation.

3,952,972

INERTIAL SEPARATOR

Donald Tedstone, St. Lambert; Hans-Herman Schaum, and John James Sanderson, both of St. Bruno, all of Canada, assignors to United Aircraft of Canada Limited, Longueuil, Canada

Filed Dec. 24, 1974, Ser. No. 536,155
Int. Cl.² B64D *33/02*
U.S. Cl. 244—53 B **8 Claims**



1. For an aircraft engine comprising an encasing nacelle and provided with an air intake and an installation for reducing ingress of super-cooled water, ice, snow and other debris to said air intake, said installation comprising a duct extending generally longitudinally of said engine, an open inlet at the forward end of said duct and an outlet, spaced from said inlet in the downstream direction of said duct, one of the walls of said duct being co-incident with a portion of said nacelle, an

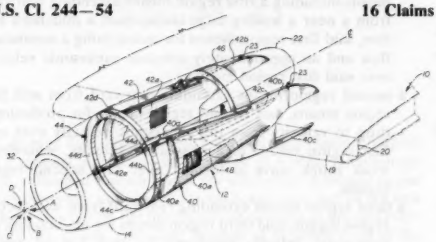
air deflecting surface in said duct extending rearwardly from said portion of said nacelle and in a direction away from said portion of said nacelle, the air deflecting surface extending over a part of the cross-section of said duct so as to confine incoming air to a passage of reduced cross-section, an opening in said portion of said nacelle downstream of the deflecting surface and formed between the trailing edge of the deflecting surface and the leading edge of a rearward part of said portion of said nacelle, said opening communicating with said air intake whereby air passing to said intake is deflected through a substantial angle around said deflecting surface whereas remaining air together with material of greater inertia passes without deflection to said opening through an outlet passage, one surface of said outlet passage being formed by said rearward part of said portion of said nacelle, the improvement comprising cyclic ice shedder means extending outwardly from and at right angles to said leading edge of said rearward part of said portion of said nacelle.

3,952,973

ENGINE MOUNTING ASSEMBLY

Varnell L. James, Enumclaw, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1974, Ser. No. 534,830
Int. Cl.² B64D *29/02*
U.S. Cl. 244—54 **16 Claims**



16. An assembly for mounting an engine on an aircraft wing having a leading edge, an upper surface, and a lower surface, said engine having a longitudinal dimension and a transverse dimension comprising:

an inboard beam having a rearward section and a forward section, said rearward section having an upper portion and a lower portion, said upper portion extending in a chordwise direction over the upper surface of said wing and having a bottom edge conforming to the shape of and engaging the upper surface of said wing, said lower portion extending in a chordwise direction over the lower surface of said wing and having a bottom edge conforming to the shape of and engaging the lower surface of said wing, said forward section being cantilevered from said rearward section and projecting forwardly from the leading edge of said wing,

a separate outboard beam having a rearward section and a forward section, said outboard beam being spaced outwardly in a spanwise direction from said inboard beam, said rearward section having an upper portion and a lower portion, said upper portion extending in a chordwise direction over the upper surface of said wing and having a bottom edge conforming to the shape of and engaging the upper surface of said wing, said lower portion extending in a chordwise direction over the lower surface of said wing and having an upper edge conforming to the shape of and engaging the lower surface of said wing, said forward section being cantilevered from said rearward section and projecting forwardly from the leading edge of said wing,

means for securing said engine to and between said inboard and outboard beams,

the forward sections of said inboard and outboard beams being spaced from each other by a distance at least as great as said transverse dimension of said engine so as to leave a space therebetween to allow insertion and removal of said engine in a generally downward and upward direction to and from a location between said beams, and

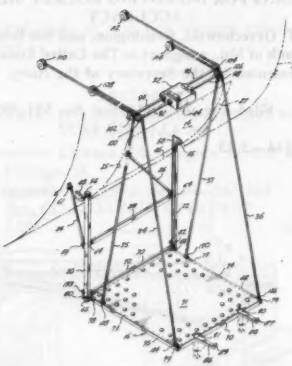
means for securing the upper and lower portions of the rearward sections of said outboard beams respectively to the upper and lower surfaces of said wing.

3,952,974

CARGO-HANDLING SYSTEM FOR STANDARD BODY AIRPLANES

John M. Lang, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 20, 1974, Ser. No. 534,829
Int. Cl.² B64D *9/00*
U.S. Cl. 244—137 R **14 Claims**



1. A stowable cargo-handling apparatus for use in an aircraft to load and unload cargo comprising:

a cargo platform movable vertically and pivotable about one edge thereof;

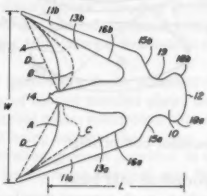
frame means for supporting and guiding said cargo platform and engaging said platform at said one edge comprising a pair of channel members pivotally attached to said aircraft adjacent a cargo hold opening, said channel members movable from a cargo lifting position extending substantially vertically downward from the cargo hold opening to a stowed position by rotation thereof through said cargo hold opening;

hoist means connected to said cargo platform by a first flexible lifting means engaging said one edge of said cargo platform and a second flexible lifting means engaging another edge of said cargo platform, said hoist means operable to move said cargo platform from a position adjacent the ground to a position adjacent said cargo hold opening by simultaneous upward movement of said first and said second flexible lifting means and operable to rotate said cargo platform from said position adjacent said cargo hold to a stowed position within said aircraft by further upward movement of said second flexible lifting means.

3,952,975
INFLATABLE KITE

Louis Lawrence Laske, Grayslake, Ill., assignor to Vonco Products, Inc., Lake Villa, Ill.

Continuation-in-part of Ser. No. 347,879, April 4, 1973, abandoned. This application May 13, 1974, Ser. No. 469,116
The portion of the term of this patent subsequent to Apr. 2, 1988, has been disclaimed.
Int. Cl.² A63H *27/08*
U.S. Cl. 244—153 R **12 Claims**



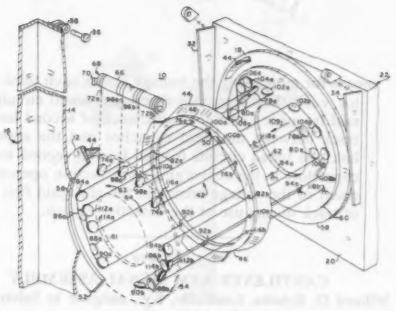
1. A kite comprising:
an inflatable rearwardly tapering body member provided with a rounded leading edge and having substantially teardrop shape, two inflatable opposing rearwardly projecting side members attached to said body member and together forming a single inflated volume wherein said rounded leading edge at its extremities defines lateral projections on each side which are shaped into a narrower neck portion, the width across said lateral projections being about 15 to about 200 percent greater than the width across said neck portion, said neck portion being shaped at the rearward end into the outer edges of said side members;
a non-inflatable web of flexible sheet material connected between the trailing edge of each rearwardly projecting side member and said body member and said web extending over at least 50 percent of the area defined by the edges of said body member, the inner edge of each side member and straight lines joining the rear extremities of said body member and each of said side members;
a line attachment means bonded to said body member; and
the ratio of the maximum width of the kite when inflated to the length of the kite being 0.5 to 1.5 and the maximum thickness of said body member when inflated is 0.15 to 0.45 of said length.

3,952,976
DEPLOYABLE FLEXIBLE TUNNEL

James C. Fletcher, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Newton D. Brown; Gordon L. Jeppesen, both of Cuyahoga Falls, Ohio, and Nicholas C. Costakos, New Orleans, La.

Filed Dec. 27, 1974, Ser. No. 536,762
Int. Cl.² B64G *1/00*
U.S. Cl. 244—158 **2 Claims**

1. A deployable tunnel comprising:
a plurality of serially arranged frame members, each having an opening therethrough;
a flexible tubular member attached along, to, and between said frame members and together comprising an elongatable accordian-like tubular housing;
a first end frame at one end of said tubular member and a second end frame at an opposite end of said tubular member;
a first pulley assembly comprising an upper and lower pulley secured to an edge side region of said first end frame;
a second pulley assembly comprising an upper and lower pulley secured to an opposite edge side region of said first end frame;
a third pulley assembly secured to an edge side region of said second end frame;
a fourth pulley assembly secured to an opposite edge side region of said second end frame opposite to the position of said third pulley assembly;
a first cable assembly comprising at least one cable extending along and guidably engaging said frame members and including means for securing at least two runs of said cable, an upper run and a lower run, between said first and third pulley assemblies and for securing one end of said cable to a said end frame;
a second cable assembly comprising at least one second cable extending along and guidably engaging said frame members and including means for securing at least two runs of said second cable, an upper and a lower run,



between said second and fourth pulley assemblies and means for securing one end of said second cable to one of said end frames;
means for applying an elongating force to said housing;
cable operating means including a winch, having a winding drum, secured to one of said end frames and all of the other, otherwise free, ends of said cables being connected to, and simultaneously wound on, said drum, whereby said tubular housing may be elongated or shortened; and
deployment means including an arm member pivotally attached between said end frames for enabling said tunnel to be deployed in an arc upon operation of said cable operating means, said arm being selectively detachable from one of said end frames, whereby said deployable tunnel is selectively deployable either along a line or along an arc.

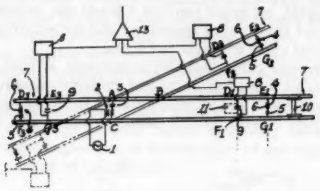
3,952,977
ELECTRICAL DETECTIVE CIRCUITS

Dirk J. Vermeulen, Johannesburg, South Africa, assignor to Western Industries (Proprietary) Limited, Johannesburg, South Africa

Filed Sept. 23, 1974, Ser. No. 508,167
Claims priority, application South Africa, June 11, 1974, 74/3701
Int. Cl.² B61L *23/16*
U.S. Cl. 246—37 **5 Claims**

1. A detective circuit for railway points composed of three track sections connected together at a junction or for a railway crossing composed of four track sections connected together at a junction, said circuit comprising:
an ac generator means for supplying energy at a selected frequency across the junction of the points or crossing,
a first capacitor connected across the junction to form a tuned circuit at the said frequency with the inductance of first lengths of track between the junction and the intersection or intersections of the tracks,
a low impedance frequency selective link connected across the tracks of each section of the points or crossing, each

link comprising a second capacitor forming a tuned circuit at the said frequency with the inductance of an inductor connected in series therewith, characterised in that the detective circuit includes a third capacitor connected across the tracks of each section of the points or crossing at a position spaced from the link on the side thereof nearest the points or crossing junction, and,



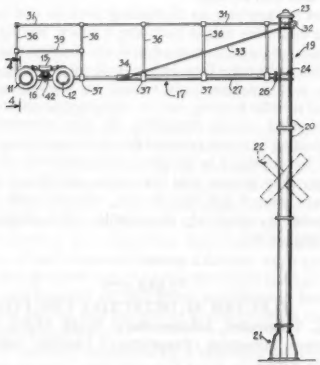
means for monitoring the voltage across each third capacitor, each third capacitor forming a tuned circuit at the said frequency with the inductance of second lengths of track between the third capacitor and the appropriate link, the tuned circuits formed by said second and third capacitors in the converging track section operating as a result of the voltage arising in the aforesaid first lengths of track during use of the detective circuit.

3,952,978

CANTILEVER ARM SIGNAL ASSEMBLY

Willard O. Reinitz, Louisville, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.

Filed Sept. 19, 1974, Ser. No. 507,356
Int. Cl.² B61L *5/12*
U.S. Cl. 246—477 **26 Claims**



1. A traffic control signal assembly comprising

a vertical mast column having a lower end anchored to a supporting base beside a traffic roadway, and a free upper end,

a fixed cantilever arm extending laterally from the free upper end of the mast column above the traffic roadway,

a fixed catwalk extending along the cantilever arm,

and a transverse jury mast journalled at the free end of the cantilever arm above the catwalk, and supporting traffic control signal lamp means in offset operative mode position facing approaching traffic near the unsupported end of the arm,

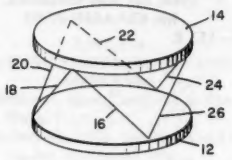
the jury mast being journalled for angular movement about its own axis relative to the fixed arm and the catwalk to swing the offset signal lamp means angularly upward above the catwalk level for convenient servicing access.

3,952,979

ISOLATOR

Siegfried Hansen, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 19, 1975, Ser. No. 551,210
Int. Cl.² F16F *15/04*
U.S. Cl. 248—20 **3 Claims**



1. A vibration isolator comprising:

a base;

a platform supported on said base;

six support members, each support member being secured to both said base and said platform, said support members supporting said platform with respect to said base, each of said support members being at right angles to its adjacent support members, said support members being arranged in three pairs, the support members in each pair being parallel to each other, each of said support members having a motor therein connected for controlling the length of its support member;

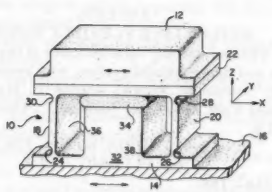
six accelerometers on said platform, connection means connecting each of said accelerometers to one of said motors for controlling said motors, said connection means including a functional amplifier from each said accelerometer to its corresponding motor so that when each said accelerometer senses acceleration, each said corresponding motor is energized to reduce acceleration.

3,952,980

TRANSLATORY SHOCK ABSORBER FOR ATTITUDE SENSORS

George L. von Pragenau, Huntsville; Irvin T. Morgan, Jr., Madison, and Clifton A. Kirby, Huntsville, all of Ala., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1974, Ser. No. 518,545
Int. Cl.² F16F *1/26*
U.S. Cl. 248—22 **1 Claim**



1. A three-dimensional translatory shock absorber device for mounting a precision instrument or the like for reducing translatory vibrations or motion along each of the three axes defined by a cartesian-coordinate system comprising;

a first L-shaped base member having a horizontal planar leg normal to the Z-axis direction and a shorter vertical planar leg normal to the X-axis direction;

a second L-shaped member spaced above said first base member and having a horizontal planar leg and a shorter vertical planar leg is parallel alignment with said first L-shaped base member;

a first translatory shock absorber device interposed between said vertical planar legs of said first L-shaped base member and said second L-shaped member for reducing translatory vibrations in the direction of the Z-axis;

a cushioning spacer interposed between said horizontal planar legs of said first L-shaped base member and said second L-shaped member;

a second translatory shock absorber device mounted upon the top surface of said horizontal planar leg of said second L-shaped member for reducing translatory vibrations in the direction of the X-axis;

a third translatory shock absorber device mounted on the top plate of said second translatory shock absorber device for reducing translatory vibrations in the direction of the Y-axis;

each of said translatory shock absorber devices comprising a first pair of spaced parallel plates and a second pair of spaced parallel plates interposed between said first pair of plates and being integral therewith;

laterally extending grooves provided in said second pair of plates at the junctions between said first and second pair of plates;

damping means interposed between said first pair of plates for limiting movement of said first pair of plates relative to each other;

said precision instrument mounted on the top plate of said third translatory shock absorber device;

whereby said grooves provide a flexible joint between said first and second pair of plates and whereby said combination of translatory shock absorber devices effectively isolates said precision instrument from translatory vibration along each axis of motion without introducing rotational effects through said shock absorber devices.

3,952,981

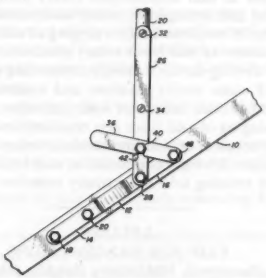
FLAG HOLDER

Arnold E. Acker, No. 6B 20800 Homestead Road, Cupertino, Calif. 95014

Filed Sept. 17, 1975, Ser. No. 614,328

Int. Cl.² H01Q *3/02*, *1/08*; B60R *19/00*; H01Q *1/32*

U.S. Cl. 248—291 **1 Claim**



1. A flag holder for boats and the like craft, comprising

a. a retaining bracket having a retaining portion and an offset portion, said retaining portion being adapted to be mounted on a support of the craft on either side thereof with the offset portion spaced from that support,

b. a bar having one end thereof pivotally mounted adjacent one end of said offset portion and disposed for receiving a flag on the other end thereof,

c. a pin secured to said bar between the ends thereof,

d. a lever having a latching indentation and being pivotally mounted adjacent the other end of said offset portion, said pin being receivable in said indentation to hold said bar in a vertical position, and the length of said lever being greater than the distance from the attachment of said bar and said offset portion to said pin plus the distance from said attachment to the attachment of said lever with said offset portion, such that one edge of said lever rides on said pin as said bar is being raised to and lowered from a vertical position.

3,952,982

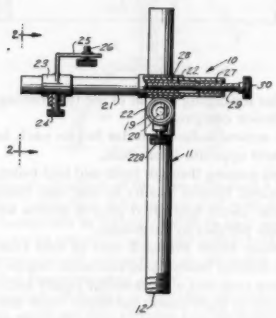
ALL ANGLE CAMERA MOUNT WITH VERNIER ADJUSTMENT

David P. Lewis, Box 20, Herold Rte. 1, Sutton, W. Va. 26601

Filed Jan. 7, 1975, Ser. No. 539,073

Int. Cl.² A47G *29/00*

U.S. Cl. 248—124 **1 Claim**



1. A camera mount comprising:

a cylindrical mast;

a first cylindrical arm;

first connecting means attaching the first arm perpendicularly to the cylindrical mast, said first connecting means including first locking means which may be engaged to prevent relative movement between the cylindrical mast and the first arm, said first connecting means permitting axial movement of the first arm along the axis of the cylindrical mast and rotational movement around the axis of the cylindrical mast when said first locking means is not engaged;

a second cylindrical arm;

second connecting means attaching the second arm perpendicularly to the first arm, said second connecting means including second locking means which may be engaged to prevent relative movement between the first arm and the second arm, said second connecting means permitting axial movement of the second arm along the axis of the first arm and rotational movement around the axis of the first arm when said second locking means is not engaged;

vernier adjustment means for accurately moving the second arm along its axis when said second locking means is either engaged or disengaged, said vernier adjustment means being attached to said second arm and to said second connecting means;

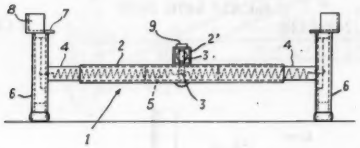
a camera mounting bracket; and

third connecting means attaching the mounting bracket to the second arm, said third connecting means including third locking means which may be engaged to prevent relative movement between the second arm and the mounting bracket, said third connecting means permitting axial movement of the mounting bracket along the axis of the second arm and rotational movement around the axis of the second arm when said third locking means is not engaged.

3,952,983
DEVICE FOR RAISING A CHAIR

Alain Crochet, "La Jordonniere", St-Pierre d'Entremont, 61800 Tinchebray, France

Filed Mar. 21, 1975, Ser. No. 560,862
Claims priority, application France, Mar. 27, 1974, 74.10479
Int. Cl.² F16M 11/38
U.S. Cl. 248—173 1 Claim



1. A device for raising a chair of the type having at least four legs, said device comprising:

first and second hollow tubular beams each having a mid-point and opposite open ends,

a pivot pin passing through both said mid-points of said first and second tubular beams so that said beams are freely rotatable about said pivot pins in planes extending substantially parallel to each other,

an extension beam for each end of said first and second hollow tubular beams, said extension beams having opposite open ends and a leg member rigidly secured to one of said ends of each extension beam, each end of said first and second tubular beams having the said other end of a said extension beam inserted therein, each said extension beam having a cross-sectional area that is slightly smaller than the cross-sectional area of its associated hollow tubular beam so that each said extension beam is movable into and out of its associated hollow tubular beam,

said leg members secured to each said one end of said extension beams being disposed to extend substantially perpendicular to each associated extension beam, each leg member having, at one end thereof, corner means for engaging a leg of a chair,

at least four coil springs, each coil spring having a first and a second end, each hollow tubular beam and associated inserted extension beam having a said coil spring disposed therein extending from said pivot pin to said leg member, with said first end of each coil spring connected to the pivot pin and said second end of each said coil spring being connected to the end of the extension beam in which said coil spring is disposed whereby said coil springs will exert a constant force tending to retract each said respective extension beam into its associated tubular beam.

3,952,984
MID-TOWER ROTARY ANTENNA MOUNT

Dracos Alexander Dimitry, 2317 Ardmore, Royal Oak, Mich. 48073

Filed Feb. 12, 1973, Ser. No. 331,826
Int. Cl.² H01Q 3/00
U.S. Cl. 248—282 1 Claim

1. A rotating and swinging antenna-orienting contrivance for mounting upon an upright of an upstanding radio communication antenna supporting structure intermediate its upper and lower ends, said contrivance comprising

a bracket structure including a pair of substantially horizontal upper and lower bracket members disposed in vertically-spaced substantially parallel relationship and having upper and lower inner ends with attachment means thereon adapted to be attached to the upright of the antenna supporting sturcture in outwardly-projecting offset relationship thereto and having upper and lower outer ends spaced outwardly away from said inner ends,

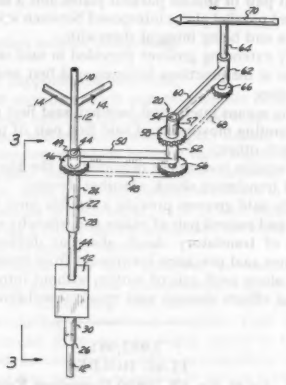
upper and lower inner bearings mounted on said upper and lower outer ends respectively in vertically-spaced coaxial relationship,

an inner rotary member journalled in said inner bearings,

an inner arm fixedly secured to said inner rotary member and having an intermediate bearing thereon disposed remote from said inner bearing in spaced parallel relationship thereto,

an intermediate rotary member rotatably mounted in said intermediate bearing,

an outer arm fixedly secured to said intermediate rotary member and having an outer bearing thereon disposed remote from said intermediate bearing in spaced parallel relationship thereto,



an outer rotary load-carrying member rotatably mounted in said outer bearing,

an inner driving device drivingly connecting said bracket structure to said intermediate rotary member and constructed and arranged to rotate said intermediate rotary member in response to the swinging of said inner arm by the rotation of said inner rotary member,

an outer driving device drivingly connecting said inner arm to said outer rotary member and constructed and arranged to rotate said outer rotary member in response to the swinging of said outer arm relatively to said inner arm by the rotation of said intermediate rotary member,

and a motor drivingly connected to said inner rotary member for rotating said inner rotary member.

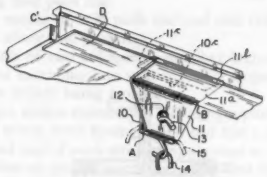
3,952,985
CLIP FOR HANGING SIGNS

Joseph A. Davenport, Middleburg Heights, Ohio, assignor to Fastway Fasteners, Inc., Lorain, Ohio

Filed Nov. 25, 1974, Ser. No. 526,634
Int. Cl.² F21S 1/02; A44B 21/00
U.S. Cl. 248—317 1 Claim

1. A unitary hanger clip, adapted to be manually clipped to an overhead beam having oppositely extending lower horizontal flanges extending a predetermined width, consisting of a single elongated strip of metal having spring characteristics, said strip having a sharp return bend at approximately midway of its length providing two upwardly extending legs; said legs lying close together but spaced apart to a predetermined substantially common level; both of said legs turning outwardly at said level at an obtuse angle forming inclined runs; said runs being of approximately equal length; and thereafter each leg being bent inwardly at approximately the same acute angle forming clipping runs; said clipping runs being of approximately equal length and having their terminal ends

spaced from each other; and the space between said acute angle bends being less than said predetermined width of said horizontally extending flanges; whereby when said clip is applied to said horizontal flanges of a beam said spring characteristics of said metal holds said clip tightly to said beam; wherein each of said legs is bent slightly along a horizontal line



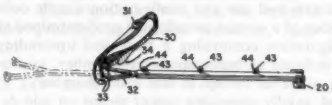
outwardly and then back inwardly at a level about 60 to 70 percent of the length upwardly from the sharp return bend to the outwardly turning obtuse angle, each of said legs at the end of said inclined runs being bent inwardly, each at an acute angle to cause said clipping runs each to be substantially parallel to its associated inclined run.

3,952,986

OUTBOARD MOTOR SUPPORT

Robert G. Wells, 2302 Liberty St., Erie, Pa. 16502

Filed Dec. 2, 1971, Ser. No. 203,979
Int. Cl.² B63H 5/12
U.S. Cl. 248—354 R **1 Claim**



1. In combination, a boat trailer for carrying a boat having an attached outboard motor with a propeller shaft housing and arranged for tilting into horizontal transport position,

the combination comprising a longitudinally extending trailer frame,

means for supporting the boat against lateral movement on said trailer frame,

a tubular frame support member square in cross section,

said frame having a rear transversely extending frame member,

a bracket fixed to said transversely extending frame member,

said bracket being disposed completely above the lower edge of said frame and comprising,

hinge means swingably connecting the lower end of said tubular support member to said bracket for vertical swinging movement thereon,

a square bar substantially the same length as said tubular member comprising a male member slidably received in said female member, whereby the lower end of said bar is disposed above said transverse frame member in all positions of said bar in said female member,

a Y-shaped member at the upper end of said bar for receiving the said propeller shaft housing of said motor,

spaced locking threaded members threadably received in said tubular member engaging said bar for effecting adjustment of said bar relative to said female member for adjusting the effective length of said support,

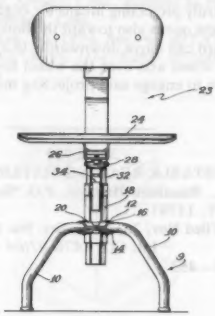
and strap means received in stirrups integrally attached to the distal end of said Y-shaped member for fastening said propeller shaft housing to said upper end of said member for receiving said propeller shaft housing.

3,952,987

CHAIR ADJUSTMENT CONSTRUCTION

Kenneth A. Bevington, Evanston, Ill., assignor to Bevco Precision Manufacturing Company, Evanston, Ill.

Filed Oct. 24, 1974, Ser. No. 517,467
Int. Cl.² F16M 11/16; A47C 3/34
U.S. Cl. 248—408 **9 Claims**



1. In a chair construction of the type including a base having an upstanding supporting tube, and a seat with a depending guide tube connected at its upper end to said seat, said depending tube being telescopically fitted within said upstanding tube, the improvement comprising an elevation adjustment mechanism for the telescoped tubes;

said mechanism including a plurality of verically spaced openings, each opening defining a substantially horizontal planar bearing surface in said depending tube;

a lever arm attached to one side of said upstanding tube, said lever arm including a downwardly inclined member having a planar surface for engaging the bearing surface through a chosen one of said openings;

means for normally biasing said lever member downwardly into said one opening; and

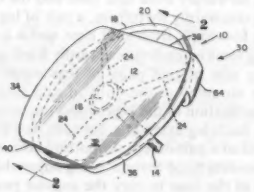
said tubes including at least a pair of engaging, complementary, wedge surfaces generally opposite said lever arm, whereby the depending tube wedge surface is directed by said inclined member into frictional wedge locking engagement with the upstanding member wedge surface while simultaneously retaining said opening in alignment for engagement by said lever arm.

3,952,988

STEERING WHEEL MOUNTED DESK BOARD

Herbert D. Easterly, 117 W. Cleveland St., Crossville, Tenn. 38555

Filed Jan. 17, 1975, Ser. No. 541,733
Int. Cl.² A47B 19/00
U.S. Cl. 248—441 B **2 Claims**



1. For use on a truck steering wheel having a central hub, an outer peripheral rim, a plurality of spokes extending radially outwardly from the hub to support the rim and a horn button on the hub extending axially above the level of the rim, said wheel being rotatable about an inclined axis such that it

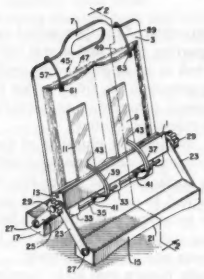
inclines downwardly from the top of its rim to the bottom of the rim, a removable desk board providing a generally flat upwardly facing work surface and a downwardly facing mounting surface, said mounting surface being contoured to provide a downwardly opening recess for receiving said horn button and generally radially extending downwardly directed abutments for engaging, respectively, said spokes to steady said board on said wheel such that said board can rest on said rim, downwardly projecting means for engaging the top of said rim, said recess opens also toward the bottom of said rim such that said board can move downwardly in a plane transverse to the inclined wheel axis over the wheel toward the bottom of the wheel rim to engage said projecting means with the top of said rim.

3,952,989

ADJUSTABLE READING MATERIAL STAND

Constance L. Bannister Hatcher, P.O. Box 8, Syosset, Long Island, N.Y. 11791

Filed Nov. 26, 1974, Ser. No. 527,253
Int. Cl.[2] A47B 97/04
U.S. Cl. 248—453 **3 Claims**



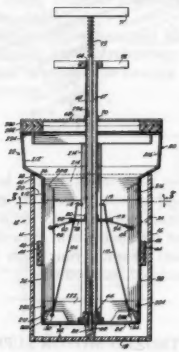
3. A portable reading material stand including, in combination, a base for supporting the reading material along its lower edges, a backing member fixed to and upstanding from said base, spaced apart means fixed to and extending upwardly from said base and spaced forwardly from said backing member and adapted to maintain the binding of the reading material between the upstanding backing member and said spaced apart means, the pages of the reading material when in operative position extending across the front surfaces of said spaced means, a finger movably mounted on said base relative to said spaced apart means for coaction with each of said spaced apart means and the pages extending thereacross, each of said fingers being biased towards said spaced apart means for releasable engagement with the pages of the reading material, and legs provided for supporting said base, one of said legs extending forwardly from said base and the other of said legs extending rearwardly therefrom, a pair of leg supporting arms extending forwardly from said base and a further pair of leg supporting arms extending rearwardly from said base, each leg supporting arm of said pairs of legs supporting arms being adjustably mounted at the ends of said base for varying the angle of inclination of the legs supporting arms with respect to said base, each leg extending between and pivotally mounted at each end to a pair of legs supporting arms and said base and the components fixed thereto being adjustable on the longitudinal axis of the base to vary the angular position of the base and the reading material mounted thereon with respect to the horizontal and releasable maintaining means is provided extending from each end of said base, one end of each pair of legs supporting arms extending between said releasable maintaining means and each end of said base and clampable therebetween to maintain the legs supporting arms in adjusted positions extended from the base.

3,952,990

CONTAINER TYPE MOLDING DEVICE OF MATCHED SEGMENTS

Onofre S. Garcia, 77 Prospect St., Newark, N.J. 07105

Substitute for Ser. No. 245,130, May 18, 1972, abandoned.
This application Aug. 27, 1974, Ser. No. 500,922
Int. Cl.[2] B29C 11/00
U.S. Cl. 249—63 **2 Claims**



1. A molding device comprising:

a female cup-shaped mold part of rigid material comprising a floor and upstanding walls defining a main chamber of predetermined size and configuration a male collapsible member of a normal uncollapsed predetermined size and configuration comprising a floor and upstanding walls and defining an inner operating chamber, said member being sized for receipt in said main chamber;

external, axially projecting spacer means on said device to space said floors a predetermined distance from one another;

guide means to space said upstanding walls of said cup-shaped mold part and said male collapsible member a predetermined distance from one another and to define a space between said upstanding walls and floor to hold a charge of flowable material to be solidified;

means to collapse the collapsible member in said female part through

a. a first stage of movement of said walls of said member generally inwardly, and

b. a second stage of axial movement of said floor of said member away from the floor of said female part;

said means to collapse including operator means to move said walls and floor of said member to a collapsed configuration and size;

said member comprising a flexible skin and rigid horizontally and vertically extending force transmitting elements fixed to the skin in the operating chamber and rigid means connecting the horizontal and vertical members to the operator means;

said operator means comprising (*a*) a rigid tube of an axial length greater than the axial length of said male member and having a first end in abutting engagement with the floor of said male member in said operating chamber and a second end extending out of said operating chamber and (*b*) an elongate rigid push rod having a first end and a second end, (*c*) means connecting said first end to the floor of said member and spring means normally urging said rod and said tube into a first normal uncollapsed size and configuration and yieldable upon telescoping movement of said tube along said rod to store energy in the spring to restore the member to the normal uncollapsed size and configuration;

the rigid means connecting comprising a plurality of first struts secured to the rigid tube for movement therewith, and to the walls of said member;

said member including a network in the operating chamber of horizontal and vertical members fixed to said skin normally maintaining said member in said predetermined size and configuration and bendable to collapse said walls and floor and said member upon movement of said tube along said push rod;

handle means on said push rod and said tube to move said tube along said push rod;

said walls of said collapsible member including embossing means extending into said space for imprinting an image on an article being molded;

said rigid means connecting including a plurality of second rigid struts, each having a first end and a second end, the second end of each strut being secured to the floor of the member at spaced points and at the first end of each strut including sliding interconnecting means of said struts to said tube permitting a predetermined amount of sliding movement of said first ends upon relative axial movement of said tube and push rod, and hook means to constrain said struts to movement with said tube upon continued relative movement of said rod and tube; and

the sliding interconnecting means comprising a ring with spaced opening secured to said tube and each of said second struts slidingly extends to one of said openings and includes said strut means on the first end thereof.

3,952,991

APPARATUS FOR EJECTING A WORKPIECE FROM A MOLD CAVITY

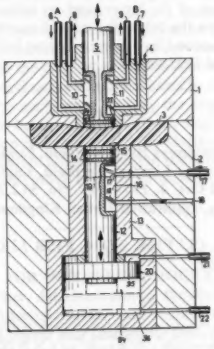
Philipp Schneider, Pappenheim, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Apr. 12, 1974, Ser. No. 460,573

Claims priority, application Germany, May 12, 1973, 2324212

Int. Cl.² B29C 7/00

U.S. Cl. 249—66 A **4 Claims**



1. An apparatus for ejecting a workpiece, said apparatus comprising:

a mold having a cavity;

a cylinder formed with a bore opening into said cavity at a surface thereof;

a reciprocable piston having an end face and displaceable in said bore between a mold position with said face contiguous with said surface and an eject position with said face retracted in said bore from said surface;

a conduit opening into said bore at a location between said face and said surface with said piston in said eject position; and

means for introducing a gas into said bore through said conduit with said piston in said eject position to eject an object from said cavity with the gas thus introduced.

3,952,992

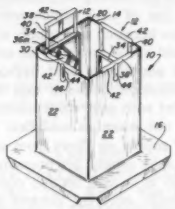
METHOD AND APPARATUS FOR FORMING DECORATIVE INLAYS IN WAX CANDLE WALLS

Emil Vyprachticky, Arvada, Colo., assignor to Premier Manufacturing Co., Arvada, Colo.

Filed Jan. 30, 1974, Ser. No. 437,870

Int. Cl.² B29C 1/14; B29D 30/100

U.S. Cl. 249—104 **2 Claims**



1. The inlay mold for use in inlaying wax inserted into the wall of a candle which comprises: an open-topped shallow marginally-rimmed reservoir adapted to receive molten wax poured therein and retain same until it hardens to form a wax insert, the underside of said reservoir being shaped to form an essentially wax tight seal with an upstanding wall of a candle mold when placed thereagainst; and, hanger means associated with said reservoir for hanging same against the wall thereof opening inwardly including an inverted generally U-shaped bail having the crossbar thereof provided with horizontally-spaced portions overhanging the rim of the candle mold cooperating therewith to prevent the reservoir from tilting from side to side and hook-forming means depending from said crossbar of the bail intermediate the upright portions at opposite ends of the latter, said hook-forming means defining a spring preloaded to press against the outside of the candle mold wall and normally hold the reservoir in wax tight sealed engagement thereagainst.

3,952,993

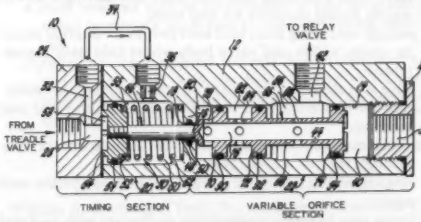
DUAL RATE VALVE ASSEMBLY

David E. Roberts, Ann Arbor, and Robert H. Wind, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed July 22, 1974, Ser. No. 490,378

Int. Cl.² F16K 21/16

U.S. Cl. 251—20 **2 Claims**



1. A dual rate air brake pressure control valve assembly comprising:

a housing having a bore therein provided with a control pressure inlet, a supply air pressure inlet, and a supply air pressure outlet adapted to be connected to a relay valve controlling the application and release of supply air pressure to an air pressure operated brake;

a multiple chambered valve assembly in said bore having a spring biasing said valve assembly toward a first position in said bore and cyclically movable therein under influence of control pressure supplied at said control pressure inlet from said first position to a second position and back to said first position;

said housing including a timing conduit connecting said control pressure inlet where pressure acts on one end of said valve assembly to a portion of said bore where pressure tends to balance said valve assembly sufficiently for said spring to move said valve assembly from said second position to said first position at a predetermined time interval of said cyclical movement independently of supply air pressure at said supply air pressure inlet and outlet;

said valve assembly having a plurality of orifice means therein with one of said orifice means providing fluid communication between said supply air pressure inlet and outlet with said valve assembly in said first and second positions and another of said orifice means providing fluid communication between said supply air pressure inlet and outlet with said valve assembly in said second position, but not when in said first position, so that a larger flow of supply air flows from said supply air pressure inlet to said supply air pressure outlet when said valve assembly is in said second position than when in said first position, only the control air flowing through said timing conduit and action of said biasing spring on said valve assembly determining the length of time said valve assembly is in said second position.

3,952,994

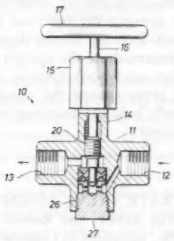
THROTTLING AND SHUT-OFF VALVE

Michael A. Karr, Jr., 9353 Rosstown, Houston, Tex. 77055

Filed Oct. 21, 1974, Ser. No. 516,795

Int. Cl.² F16K *25/00*

U.S. Cl. 251—210 **6 Claims**



1. A throttling and shut-off valve comprising:

a valve body having inlet and outlet ports;

a valve stem extending into said body and having a downwardly facing shoulder on said stem;

a passage extending from said inlet port to an internal circular cavity within said valve body where said stem is positioned;

a valve seat member adapted to be positioned in said cavity;

means for delivering fluid through said passage to said seat member;

said seat member cooperating with said stem to throttle flow through the valve apparatus;

a ring of seal material surrounding said stem within said cavity;

a facing ring having a tapered face in contact with said seal ring within said cavity, said tapering face being constructed and arranged relative to the shoulder on said stem to move toward said seal ring to cause said seal ring to expand radially toward the stem which extends through said seal ring and thereby provide a seal along said stem and which seal ring expands radially outwardly against the well of said cavity to seal thereagainst; and,

an outlet port communicated with said cavity for delivery of fluid flow along said stem on moving past said valve seat.

3,952,995

LIFTER MECHANISM FOR SPRING-LOADED VALVE

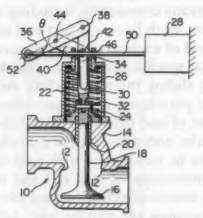
Shin-Ichi Nagumo, Yokohama, and Tatuhiro Yuta, Yokosuka, both of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed May 5, 1975, Ser. No. 574,258

Claims priority, application Japan, May 11, 1974, 49-52497

Int. Cl.² F16K *31/44*

U.S. Cl. 251—232 **6 Claims**



1. A valve lifter mechanism for a fluid flow control valve, which valve has a valve housing, a valve seat formed in the housing, a valve element formed on an axially movable valve stem, one end of the stem extending outwardly of the housing, and a compression spring arranged such that the valve element is normally held spaced from the valve seat due to a compression force exerted on the stem, the lifter mechanism comprising a first link member fixed to and extending from the extending end of the valve stem in the same axial direction, a second link member pivoted at a first end thereof to an extending end of said first link member, a third link member pivotally mounted at a first end thereof on a shaft fixedly supported by a stationary member, a second end of said third link member being pivoted to said second link member at an intermediate point of the latter, and an actuating means for exerting a force on the other end of said second link member and rotating the second link member about both the pivots for the first and third link members.

3,952,996

VALVES

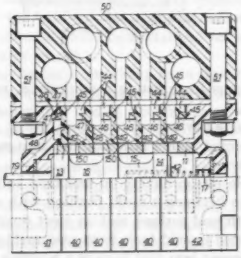
John Charles Humphreys Hart, Sheffield, England, assignor to Bridon Engineering Limited, Sheffield, England

Filed Oct. 4, 1974, Ser. No. 512,255

Claims priority, application United Kingdom, Oct. 5, 1973, 46525/73

Int. Cl.² F16K *27/04*; F15B *13/04*

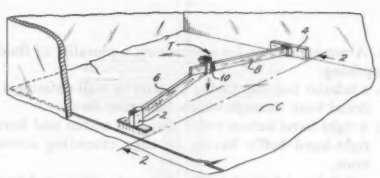
U.S. Cl. 251—324 **8 Claims**



1. A valve comprising:

a. a valve housing including a plurality of juxtaposed generally annular members of synthetic plastic material, each of said members having an integral diaphragm member;
b. a ported sleeve; and
c. a spool member, the spool member being reciprocably mounted within the ported sleeve, said diaphragm members being located to mount the sleeve within the valve housing.

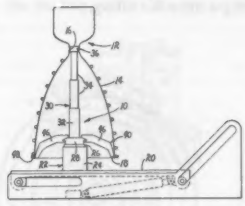
3,952,997
CARPET STRETCHING TOOL
Max D. Whitlock, Rte. 4, Mount Vernon, Ill. 62864
Filed Jan. 2, 1975, Ser. No. 537,918
Int. Cl.² A47G *27/04*
U.S. Cl. 254—63 **9 Claims**



1. A carpet stretching tool comprising: a gripping head having spikes positioned thereon to embed in a carpet, the gripping head further having spaced apart parallel walls which form a bracket thereon; a foot piece having a generally flat surface adapted to abut against a fixed surface and having its end between the parallel walls of the bracket on the gripping head; a first bolt extended through one of the walls of the bracket on the gripping head and bearing against first stretcher arm to secure the first stretcher arm to the bracket of the gripping head; a second stretcher arm pivotally connected to the foot peice and having its end between the walls of the bracket on the foot piece; a second bolt extended through one of the walls of the bracket on the foot piece and bearing against the second stretcher arm to secure the second stretcher arm to the bracket of the foot piece; and pivot means pivotally connecting the stretcher arms to enable the arms to pivot relative to each other to vary the angle between them, the pivot means being capable of firmly engaging the stretcher arms so as to not slide longitudinally along the arms, whereby when the included angle between the arms increases, the gripping head will move away from the foot piece and stretch the carpet.

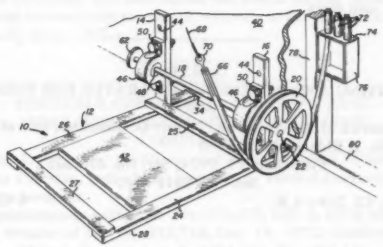
3,952,998
DEVICE FOR INSTALLING ROCKET ENGINES
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Thomas R. George, Jr., Thousand Oaks, Calif.
Filed Apr. 25, 1975, Ser. No. 571,821
Int. Cl.² B66F *3/00;* **F41F** *3/04*
U.S. Cl. 254—124 **6 Claims**

1. In a device for installing rocket engines of the type including a base, an extensible pedestal mounted on the base, a lift platform coaxially related to the pedestal having an annular support for receiving the thrust chamber exit of a rocket engine, and an extensible internal probe coaxially related to said pedestal and adapted to be extended into supporting engagement with the internal surface of the thrust chamber of the rocket engine, the improvement comprising:
coupling means for interconnecting said platform in pivotal relation with said pedestal;
said coupling means including a first bearing means affixed to said platform and defining a bearing mount of a concave configuration;
second bearing means affixed to said pedestal including a



bearing surface defining a seat of a convex configuration for receiving said mount.

3,952,999
WIRE PULLING APPARATUS
Charles Robert Keller, 2816 Kring, San Jose, Calif. 95125, and William D. Martin, 12749 Quito Road, Saratoga, Calif. 95070
Filed May 12, 1975, Ser. No. 576,286
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 R **6 Claims**



1. An apparatus for use in pulling a wire through a conduit which terminates at an outlet box installed on a wall comprising:
a base including a planar bottom surface adapted to be positioned on a floor near the outlet box, said base including means for anchoring said base to the wall;
a pair of upstanding members each being affixed to said base;
a shaft oriented with its axis parallel to said base and journaled proximate each end to said upstanding members; and
a pulley having a grooved rim and being secured to a first end of said shaft, said rim being formed to receive the wire and having a diameter large enough to prevent the wire from acquiring a set.

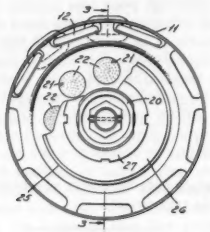
3,953,000
HOIST WITH LOAD LIMITING DEVICE
William R. Zorbaugh, York, Pa., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.
Filed Nov. 29, 1974, Ser. No. 528,166
Int. Cl.² B66D *1/00*
U.S. Cl. 254—169 **6 Claims**

1. In a hand hoist, the combination comprising
a hand wheel adapted to be moved by hand,
said wheel having a plurality of circular openings therein spaced circumferentially of said wheel,

a plurality of friction discs positioned in said openings and having opposed surfaces,

said discs being independently rotatable in said openings about the axis of said openings,

a driven member adapted to be connected to the hoist for providing a drive for lifting,



said driven member having a surface engaging one of said opposed surfaces of said discs,

a pressure member engaging the other of said surfaces of said discs,

and means yieldingly urging said pressure member toward said discs.

3,953,001

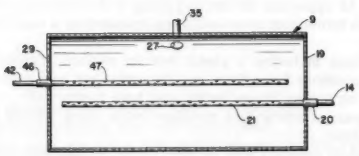
MIXING AND DISPENSING APPARATUS FOR POISON SPRAY

Frederick M. Gleockler, and Robert G. Gleockler, both of R.D. No. 1, Ridgely, Md. 21660

Filed June 11, 1974, Ser. No. 478,225

Int. Cl.² B01F *5/10*

U.S. Cl. 259—4 R **8 Claims**



1. An apparatus for mixing and dispensing poisonous spray comprising a container, a conduit system connected to a source of water supply under pressure and having outlets discharging into top and bottom portions of the container, means for selectively controlling discharge of the water from said outlets, an access opening in the top portion of said container for supplying the container with a poison in powder form, a closure for said opening, a discharge conduit leading from said container, a pump for forcing the mixture under pressure through said discharge conduit from the container, a branch conduit leading from said discharge conduit, beyond said pump, and discharging back into the bottom portion of the container, and valve means for controlling the flow of the mixture either through said branch conduit or to the outlet end of the discharge conduit.

3,953,002

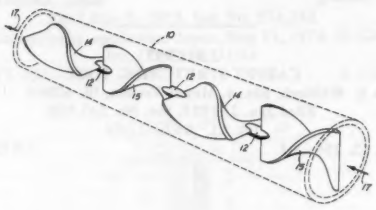
MOTIONLESS MIXING DEVICE

Herbert C. England, Jr., and William C. Voigt, Jr., both of 5018 1st Ave. N., Birmingham, Ala. 35212

Filed Sept. 21, 1973, Ser. No. 399,377

Int. Cl.² B01F *15/02*

U.S. Cl. 259—4 AB **4 Claims**



1. A mixing device for intermixing a plurality of fluids and comprising:

a. a tubular housing having an interior wall defining a cylindrical bore through which fluid may flow;

b. a right-hand helical baffle disposed within said bore, said right-hand baffle having an edge extending across said bore,

c. a left-hand helical baffle disposed within said bore and axially spaced from said right-hand helical baffle, said left hand helical baffle having an edge extending across said bore, the edge of said right-hand baffle being spaced from the edge of said left-hand edge, said edge of said left-hand baffle being angularly disposed with respect to said edge of said right hand baffle, and

d. a circular diffusion link in only the central portion of said bore and spaced inwardly from the interior wall of said housing, said link being supported solely by its end portions being secured to and extending between the central portions of the adjacent edges of said left-hand baffle and said right-hand baffle for spacing these edges apart, said link tapering toward both of its ends and overlapping on both sides the central end portion of each of said central portions.

3,953,003

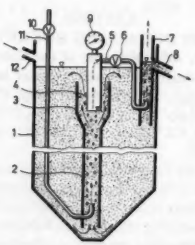
TANK PROVIDED WITH PNEUMATIC MIXING PIPE

Laszlo Mahig, Budapest XIV, Hungary, assignor to Aluterv Aluminiumipari Tervezo Vallalat, Budapest XIII, Hungary

Filed June 6, 1974, Ser. No. 477,551

Int. Cl.² B01F *13/02*

U.S. Cl. 259—4 R **3 Claims**



1. A tank for mixing fluid material, especially suspensions comprising a tank provided with a vertical mixing pipe, a vertical air lifting pipe, a gas collecting chamber located at the upper end of said mixing pipe, and a connecting pipe affixed at one end to said collecting chamber and communicating

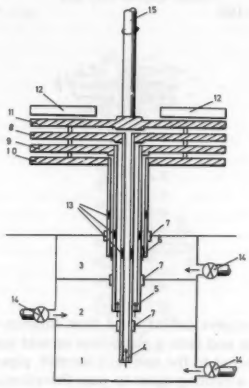
therewith and affixed at its other end to the bottom of said air lifting pipe and communicating therewith.

3,953,004

APPARATUS FOR THE SIMULTANEOUS PUMPING-MIXING OF SEVERAL NON-MISCIBLE LIQUIDS

Pablo Schmidt, and Alberto Sfeir, both of Santiago, Chile, assignors to Corporacion de Fomento de la Produccion, represented by Comite de Investigaciones Technologicas, Santiago, Chile

Filed Aug. 21, 1974, Ser. No. 499,277
Claims priority, application Chile, Aug. 22, 1973, 503
Int. Cl.² B01F *5/22, 7/26*
U.S. Cl. 259—23 **3 Claims**



1. Apparatus for the simultaneous pumping-mixing of several non-miscible liquids comprising a rotor disposed within an agitation tank, said motor comprising several rotatable centrifugal impellers superimposed one over the other; concentrical suction tubes inserted into each other, each of said suction tubes being attached to one of said impellers; a lower section of each said suction tube being introduced into corresponding separate flow boxes for each liquid, said lower section being screwable to an upper section of the same said suction tube; said separate flow-boxes being installed underneath and aligned axially to said rotor.

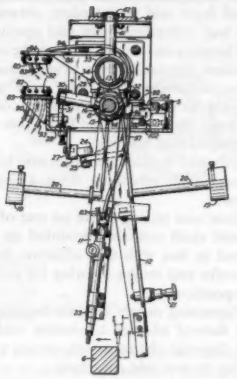
3,953,005

APPARATUS FOR CUTTING CONTINUOUSLY CAST METAL STRANDS INTO BILLETS

Joseph Rokop, Pittsburgh, and Geoffrey W. Hughes, McMurray, both of Pa., assignors to Rokop Corporation, Pittsburgh, Pa.

Filed Jan. 16, 1975, Ser. No. 541,414
Int. Cl.² B23K *7/02, 37/02*
U.S. Cl. 266—50 **9 Claims**

1. Apparatus for automatically cutting a continuously cast metal strand into billets, comprising a cutting table for supporting such a strand as it travels forward over the table, a guide rod above the rear end of the table and extending lengthwise of it, a torch arm and a feeler arm extending downwardly from the guide rod, means secured to the upper ends of said arms and slidably and rotatably mounted on the guide rod to support the arms independently of each other and permit their lower ends to be swung transversely of the table independently of each other, a cutting torch secured to the torch arm and directed downwardly therefrom, the feeler arm extending below the torch for engaging one side of a strand on the table but normally spaced laterally from the strand, the torch arm being rotatable on said guide rod toward the feeler arm, means carried by the feeler arm for engaging the torch arm to reverse said rotation of the torch arm and position the lower end of the torch over the upper edge of said side of a strand when the feeler arm swings into engagement with said side, a stop above the table forward of said guide rod for engagement by the leading end of the strand and movable



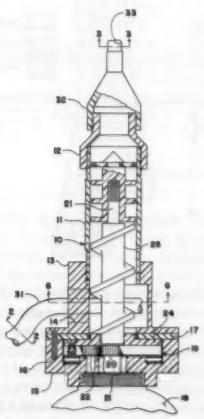
forward by it, means connecting the stop with said arms-supporting means for moving said arms forward on said guide rod with the stop, and means for swinging the torch arm away from the feeler arm and across the strand as said arms are moved forward with the strand, whereby to cut the strand and thereby form a billet.

3,953,006

PORTABLE CONVERSION AND DISPENSING APPARATUS FOR CURABLE ELASTOMERIC COMPOUNDS

Adam J. Patarcity, Levittown, and Daniel J. Smith, Washington Crossing, both of Pa., assignors to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 439,478, Feb. 4, 1974, which is a division of Ser. No. 315,710, Dec. 15, 1972, abandoned. This application Aug. 9, 1974, Ser. No. 496,231
Int. Cl.² B29B *1/10*
U.S. Cl. 259—191 **8 Claims**



1. A portable, hand held dispensing device for installing an in situ curable, elastomeric composition for sealing substrates

and the like, wherein said composition prior to installation, comprises at least one discrete, uncured polymeric composition and at least one discrete curing agent therefor, comprising, in combination:

a. an elongated housing comprising a barrel, a throat plate having an intake opening to receive said curable elastomeric composition, and a dispensing end oppositely disposed from said throat plate, means defining a vertical side wall extending from said opening to the bottom of said housing and terminating on the opposite side thereof;

b. a hollow, rotatable screw in said housing, one end of said screw communicating with said intake opening and adapted to receive said curable composition, fragment the same and convey said fragments toward said dispensing end of said housing;

c. a drive shaft in said housing in said hollow screw, the ends of said shaft extending from a respective end of said screw;

d. at least one mixing blade on one of said extending ends of said shaft rotatably mounted on said shaft and positioned in line with and adjacent the end of said screw opposite said intake opening for mixing said fragmented composition;

e. a dispensing nozzle on said housing on said dispensing end thereof adapted to receive said mixed composition and dispense the same into or on a substrate for in situ curing to seal said substrate;

f. single power means for rotating said shaft and said screw; and,

g. power transmission means operatively connect to said drive shaft, said screw and said power means whereby said screw and said shaft are rotated at different speeds and directions.

3,953,007

WALL CONSTRUCTION OF A SHAFT FURNACE

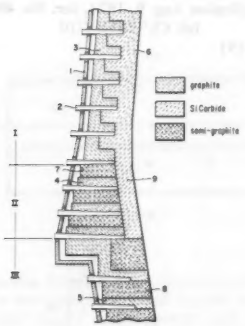
Jacobus van Laar, Santpoort, Netherlands, assignor to Hoogovens Ijmuiden B.V., Ijmuiden, Netherlands

Filed Sept. 6, 1974, Ser. No. 503,658

Claims priority, application Netherlands, Sept. 12, 1973, 7312549

Int. Cl.² C21B 7/10

U.S. Cl. 266—193 **10 Claims**



1. A shaft furnace having a refractory-lined wall at least part of which is provided with liquid-cooled cooling plates which extend into the lining and are grouped in a plurality of horizontal planes, the cooling plates in each said plane being in heat-transfer contact with an associated ring extending around the furnace and consisting of refractory material of a first kind having a heat conductivity coefficient (λ) at 20°C of at least 25 kcal/h.m.°C, and the interior face of the lining being provided at least partly by refractory material of a second kind which has high resistance to wear and chemical attack and has a minimum reaction temperature (Tu) of at least 600°C and a heat conductivity coefficient (λ) at 20°C of at least 8 kcal/h.m.°C.

3,953,008

BLAST FURNACE EVAPORATIVE COOLER

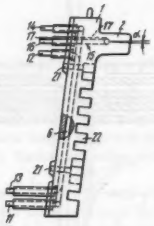
Kazimir Dominikovich Bashinsky, 521 mikroraion, 67, kv. 28; Leonid Davidovich Golod, prospekt Pravdy, 7, kv. 192; Boris Ruvimovich Granovsky, ulitsa O. Yarosha, 29, kv. 23; Leonid Markovich Dunaevsky, ulitsa Dzerzhinskogo, 95, kv. 19; Grigory Ivanovich Kasyanov, prospekt Lenina, 64b, kv. 63, and Gennady Alexandrovich Kudinov, prospekt Gagarina, 32, kv. 203, all of Kharkov, U.S.S.R.

Filed May 23, 1974, Ser. No. 472,915

Claims priority, application U.S.S.R., May 25, 1973, 1926807

Int. Cl.² C21B 7/10

U.S. Cl. 266—193 **2 Claims**



1. An evaporative cooler for a blast furnace comprising a stave having an end face; a projection on said stave extending crosswise adjacent to the end face thereof; pipes provided in said stave for a cooling agent to pass therethrough; inlet and outlet end portions for said pipes located on the side of said stave opposite to said projection and arranged vertically at different levels; and a pipe for circulation of a cooling agent provided in said projection and so arranged therein that its inlet and outlet end portions are interposed between said outlet end portions of the pipes incorporated within said stave.

3,953,009

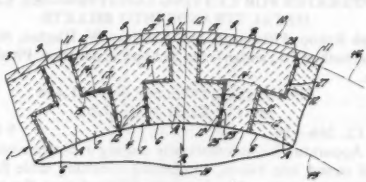
METALLURGICAL VESSEL

Yih-Renn Kan, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 19, 1975, Ser. No. 588,378

Int. Cl.² F27B 7/28

U.S. Cl. 266—283 **3 Claims**



1. A vessel for holding molten iron and the like, the vessel comprising,

a. an external hollow substantially cylindrical support member; and

b. a refractory lining disposed against the inner surface of the support member comprising at least one course of refractory bricks, the bricks having a head portion and a base portion arranged in a T-shaped configuration and the bricks being disposed in the course on their face surfaces in an intermeshing relationship where each brick

is separated from, and bonded to, each adjacent brick by a layer of refractory mortar having a relatively uniform thickness and where adjacent bricks are oppositely oriented in the radial direction to define circumferentially oriented, registered and joining under surfaces between the head portions of adjacent bricks, the relationship also providing the course with a uniform radial thickness.

3,953,010

RESILIENT MOUNTING FOR A SHOCK ABSORBER

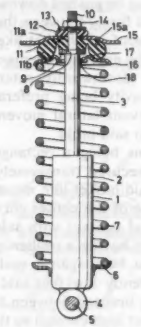
Jacob de Vos, Oud-Beijerland, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,455

Claims priority, application Netherlands, Feb. 5, 1974, 7401538

Int. Cl.² B60G 11/56

U.S. Cl. 267—34 **6 Claims**



1. A resilient mounting for a supporting system including a shock absorber having two telescoping parts, each part including a cup to support one end of a helically wound spring coaxially arranged around the shock absorber between the cups, a first mounting for connecting one part to a supporting member, and a second mounting for connecting the other part to the member to be supported, one of said mountings including a resilient member against which the respective cup rests and through which both the bearing force of the spring and the damping forces occurring during the ingoing motions of the shock absorber are transferred to the supporting construction or the member to be supported, wherein the improvement comprises a cup having first and second portions resting against the resilient member which includes two portions, the first cup portion serving to transfer the damping force occurring during the ingoing stroke of the shock absorber and the second cup portion serving to transfer the carrying force of the helical spring onto the resilient member.

3,953,011

VEHICLE SHOCK ABSORBER

Paul M. Staehlin, 9307 S. McVickers, Chicago, Ill. 60453, and William Nicholas, 1415 W. Pratt Blvd., Chicago, Ill. 60626

Filed Dec. 6, 1974, Ser. No. 530,075

Int. Cl.² F16F 1/22

U.S. Cl. 267—48 **5 Claims**

1. A shock absorber being adapted to be mounted on a vehicle between the body and the axle comprising,

shaft means adapted to be mounted on the vehicle body,

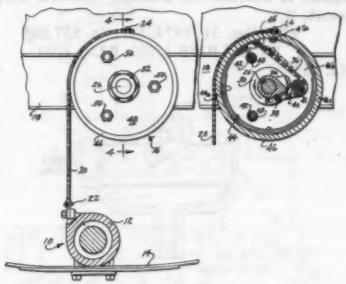
lever means including a roller sleeve rotatively supported on said shaft means and cam means carried by said roller sleeve and a flexible elongated motive conductor having a first end mounted on the roller sleeve and engageable with said cam means,

a housing surrounding said shaft means and said lever means and rotatively supported on said lever means,

resilient means being attached to said housing,

said flexible motive conductor having a second end being attached to said resilient means,

an elongated strain conductor having a first end being attached to and around the periphery of said housing and having a second end adapted to be attached with the vehicle axle, whereby said motive conductor, said resil-



ient means and said strain conductor are concurrently placed in greater tension in one rotative direction than in the opposite rotative direction, and

means for constraining said roller sleeve against rotation on said shaft means,

said resilient means including arcuate shaped spring means engaging in an arcuate path about the inner periphery of the housing.

3,953,012

TORSIONAL EXTRUSION ENERGY ABSORBER OR EXTRUSION TORQUE LIMITER

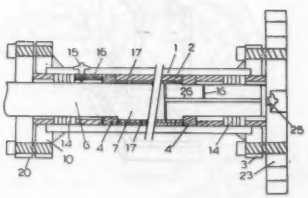
William Henry Robinson, Wellington, New Zealand, assignor to New Zealand Inventions Development Authority, Wellington, New Zealand

Filed Nov. 11, 1974, Ser. No. 522,838

Claims priority, application New Zealand, Nov. 21, 1973, 172665

Int. Cl.² F16F 1/14

U.S. Cl. 267—154 **8 Claims**



1. A bi-modal device comprising a driven member and a driving member, said driven member being an outer cylinder and said driving member being a shaft extending coaxially through said cylinder for rotation therein, a radially extending projection on a portion of said shaft within said cylinder, seals to confine an annular space between the projection and the cylinder, a crystalline material filling said space, such material being adapted to transform energy to heat continuously by being extrudable and capable of spontaneous recovery and recrystallization at the working temperature of the device, wherein below a predetermined torque applied between the cylinder and the shaft the device rotates in a first mode as a whole, and that above the said predetermined torque the shaft and projection, in a second mode, rotate and extrude the said material, whereby in the second mode the device is an energy

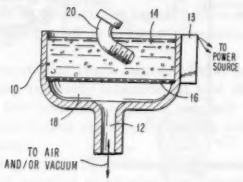
absorber, and in the relation between the first and the second mode it is a slipping clutch.

3,953,013

METHOD AND APPARATUS FOR CLAMPING A WORKPIECE IN A QUASI-LIQUID MEDIUM

John E. Griffith, Mahopac; David D. Grossman, Yorktown Heights, both of N.Y., and Peter M. Will, Norwalk, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1974, Ser. No. 537,805
Int. Cl.² B25B *11/00*; B23Q *3/00*
U.S. Cl. 269—7 **4 Claims**



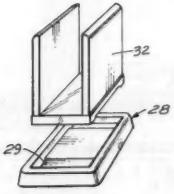
3. A method for clamping a workpiece in a desired position comprising the steps of inserting said workpiece in an open topped vessel containing a particulate fluidizable material located therein, and including the step of fluidizing said particulate material by causing a low pressure gas stream to flow upwardly through said particulate material to fluidize same, adjusting said workpiece to a desired location, and applying a vacuum to said vessel whereby said particulate material is de-fluidized and caused to substantially solidify clamping said workpiece in the desired position.

3,953,014

HOLDING MEANS

Lester W. Mendell, Jr., 1432 Mariposa, Corona, Calif. 91720

Filed Feb. 24, 1975, Ser. No. 552,322
Int. Cl.² B22D *5/00*; B25B *5/14*
U.S. Cl. 269—43 **6 Claims**



1. Holding means for frictionally engaging a pair of relatively smooth-sided flat members and thereby confine them in any of a plurality of fixed positions in spaced apart paths of travel, the resulting frictional forces on said flat members from said holding means being yieldable to permit easy movement of said flat members between different ones of said fixed positions;

said holding means being also adapted to firmly hold said flat members in positions of downward extension into the cavity of a cooperating casting mold of such character that a web-like body interconnecting the flat members at the bottom can then be formed therein;

said holding means comprising generally box-shaped basket-like means adapted to receive said pair of relatively smooth-sided flat members, said basket-like means having a pair of opposite sides against which said flat members can fit flush when pushed outwardly towards same, said holding means comprising, additionally, resilient means associated with said basket-like means and adapted to bear outwardly against said flat members and hold them flush against said opposite sides, when the flat members are positioned between the resilient means and said opposite sides, and thereby create said frictional forces on said flat members;

said holding means being paricularly adapted for use in the manufacture of an open-topped napkin holder of the type having planarly parallel sides and a flat, integral bottom, wherein said flat members are preformed sides for said napkin holder and said web-like body forms the bottom of the napkin holder;

said box-shaped basket-like means being a skeletal structure made of relatively thin steel rods and having at least three legs adapted to provide stable support on the top of said mold, said top comprising a rim around the cavity in the mold, so that a pair of napkin holder sides loaded in said holding means can be pushed downwardly into said cavity and then be held firmly between the resilient means and the opposite sides of said basket-like means until an integral bottom for the napkin holder is cast in said cavity, the fit between the downwardly extending napkin holder sides and the cavity being preferably snug enough to substantially prevent lateral movement of said holding means relative to said mold;

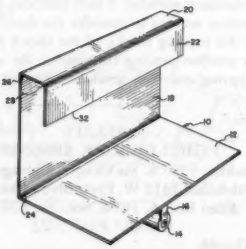
said resilient means being a rectangular sheet of plastic material firmly secured transversely across its center at the bottom of said basket-like means so that its half segments either side of the center curve upwardly to make resilient frictional contact with said opposite sides, the rectangular sheet having a resiliency such as to cause its curved halves to bear against said opposite sides with pressures sufficiently low that said napkin holder sides can be manually inserted between the half segments and opposite sides, yet high enough so that said half segments hold the napkin holder sides firmly in position, said resiliency also being such that said napkin holder sides can be manually shifted, either before or after the sides are interconnected with the molded napkin holder bottom.

3,953,015

CEILING HANGER

John D. Taylor, and Tommy R. Whitmer, both of Frederick, Okla., assignors to Goldblatt Tool Company, Kansas City, Kans.

Filed Oct. 11, 1974, Ser. No. 514,117
Int. Cl.² E04G *17/18*
U.S. Cl. 269—46 **6 Claims**



1. A tool to temporarily support an end of a ceiling panel from a joist for subsequent attachment thereto comprising:

a base plate having a vertical wall portion along one edge;

said vertical wall portion including separable overlapping planar wall members;

an inverted U-shaped flange portion along the top edge of one of said wall members;

said inverted U-shaped flange portion being adapted to hang over the top edge of a ceiling joist with said base

plate extending thereunder to receive and support an end edge of a ceiling panel;

at least a pair of vertically spaced holes in one of said planar wall members and at least one hole in the other wall member; and

fastening means are provided to engage through said holes while in registered positions to hold said planar wall members in at least two extended overlapping heights to accommodate joists of different widths;

the effective distance between the open bottom of said U-shaped flange and the top of said base plate at any one position being greater than the width of said joists plus the thickness of said ceiling panel so that after attachment of said ceiling panel to said joist, said tool can be raised to clear said joist and be removed therefrom.

3,953,016

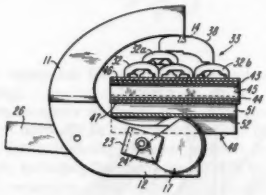
BRAZE FIXTURE

Harry C. Gersbacher, Dayton, Ohio, assignor to United Aircraft Products, Inc., Dayton, Ohio

Filed Feb. 14, 1975, Ser. No. 549,879

Int. Cl.² B25B *1/24*

U.S. Cl. 269—236 **21 Claims**



1. A braze fixture, including a plurality of like pressure applying members, each providing a triangular arrangement of work contacting downwardly projecting pads, said pressure applying members being arranged in a triangular grouping, a single means commonly suspending said plurality of pressure applying members at a location intermediately of their respective pads with individual freedom of relative tilting motion, said single means and said plurality of pressure applying members forming a pressure applying cluster, and means for supporting said cluster for application therethrough of direct or reactant pressures.

3,953,017

GATHERER SYSTEM

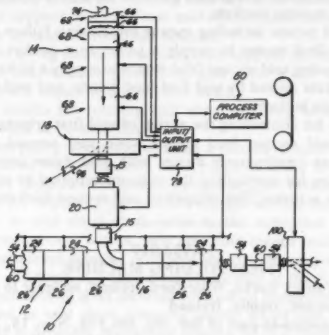
James C. Wise, Easton, Pa., assignor to Harris-Intertype Corporation, Cleveland, Ohio

Filed May 7, 1973, Ser. No. 357,607

Int. Cl.² B65H *39/02*

U.S. Cl. 270—54 **11 Claims**

8. A system for producing different magazines composed of different predetermined combinations of signatures for different subscribers in accordance with predetermined criteria from known subscriber information, said system comprising main gatherer means for feeding main combinations of signatures, said main gatherer means including a means for defining a plurality of main feed stations, main feed means at said main feed stations for feeding signatures, and main conveyer means for receiving signatures from said main feed means at said main feed stations and transporting the signatures to a receiving location, secondary gatherer means for feeding at least two different special combinations of signatures in accordance with known subscriber criteria, said secondary gatherer means including means for defining a plurality of secondary feed stations spaced from said main gatherer means, secondary conveyer means for transporting signatures, and a plurality of secondary feed means each of which is associated with one of said secondary feed stations for feeding signatures at said secondary feed stations to said secondary conveyer means, control means for rendering some of said secondary feed means ineffective to feed signatures to said secondary conveyer means and effecting operation of at least one of the other of said secondary feed means to feed signatures to said secondary conveyer means to provide a first special combination of signatures for one subscriber and for thereafter rendering at least said one of said secondary feed means ineffective to feed signatures to said secondary conveyer means and effecting operation of at least some of said secondary feed means to feed signatures to said secondary conveyer means to provide a second special combination of signatures which is different than said first special combination of signatures, and signature feed means for combining a special combination of signatures fed by said secondary gatherer means with a main combination of signatures fed by said main gatherer means.



3,953,018

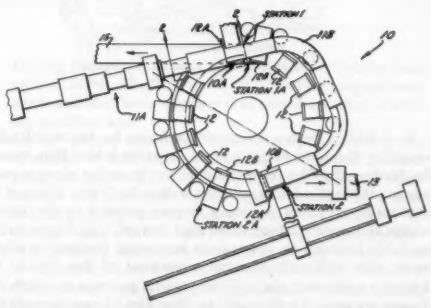
COLLATING APPARATUS

Bernard J. Maopolski, Easton, Pa., assignor to Harris Corporation, Cleveland, Ohio

Filed June 3, 1974, Ser. No. 475,576

Int. Cl.² B65H *5/30*

U.S. Cl. 270—55 **4 Claims**



1. In a newspaper stuffer for inserting newspaper sections into a newspaper jacket,

said stuffer having pockets movable along a path and stationary bottom-feed hoppers spaced along the path of the pockets and having at least a first and second of said hoppers each adapted to hold a supply of said jackets and positioned in a generally side-by-side relationship,

said second hopper being downstream of said first hopper in the direction of movement of said pockets and said first and said second hoppers being in adjacent relationship along said path,

separate first and second feed means associated respectively with said first and second hoppers for withdrawing jackets

from the associated hopper and supplying the withdrawn jackets to said moving pockets, said first and second feed means including,

respective vacuum-actuated first grippers for engaging and withdrawing jackets from said respective hoppers, continuously rotating drums adjacent said respective hoppers, and second grippers carried by said continuously moving drums for receiving signatures from said respective vacuum-actuated first grippers and for supplying the jackets to said moving pockets,

control means including means for sensing failure of said first feed means to supply a jacket to a pocket and for actuating said second feed means to supply a jacket to the pockets missed by said first feed means, and said control means including,

means for controlling the action of said first gripper means of said second feed means while said second gripper means continuously moves with said drum comprising means for controlling the vacuum supplied to said vacuum actuated first gripper of said second feed means.

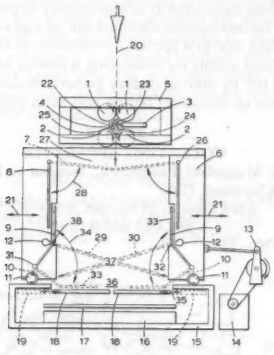
3,953,019
FILM FOLDING MACHINE

Ronald Patrick Burke, Waterford, Ireland, assignor to Fitzwilton Limited, Dublin, Ireland

Continuation-in-part of Ser. No. 306,575, Nov. 15, 1972, abandoned. This application Jan. 9, 1975, Ser. No. 539,776

Int. Cl.² B65H *45/00*

U.S. Cl. 270—61 F **4 Claims**



1. A folding device comprising a frame having an inlet for receiving film to be folded and an outlet for folded film, means for feeding the film from the inlet to the outlet along a path passing through a folding station within the frame adjacent to the outlet, opposed retaining fingers pivoted to the frame within and closely adjacent the inlet thereof, said fingers being movable between an upper near horizontal position in alignment with said path wherein movement of the film to be folded is restrained and a lower vertical position in which the fingers are spaced sufficiently to allow film to pass through the inlet freely into the frame, retaining means adjacent the outlet for holding back the film at the folding station until the completion of each set of folding operations on a length of film being folded, at least two opposed sets of blow means to project a pressurized gas onto the film at successive levels of the film to produce successive folds therein, the sets of blow means being disposed one on each side of the film path so that in use one set acts on one face of the film and the other set acts on the other face, and, corresponding to the two sets of blow means, two arrays of movable folding feet disposed also one on each side of the film path and movable between an inoperative position and a position in which, once a fold has been initiated in the film by the action of a set of blow means projecting pressurized gas onto one face of the film, the fold is completed by the array of feet on the opposite side of the film relative to the blow means producing the fold pressing down upon the opposite face of the film to that which is receiving the pressurized gas, the array completing the particular fold being immediately thereafter returned to its inoperative position, whereupon the other set of blow means acts upon the opposite face of the film and the initiation of the next fold by the gas pressure is completed by pressure upon the other face of the film by the other array of feet being moved from their inoperative position to a position in which they press down upon the other face of the film, the sequence being repeated a number of times governed by the length of film to be folded and the number of folds needed in that length.

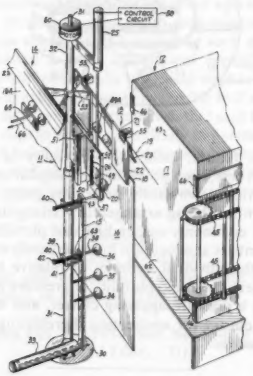
3,953,020
BAG ALIGNER MACHINE

Walter Ruf, Spring Valley, and Robert George Kelley, Central Valley, both of N.Y., assignors to St. Regis Paper Company, New York, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,020

Int. Cl.² B65H *3/08, 5/10, 9/10*

U.S. Cl. 271—14 **18 Claims**



1. A bag aligner machine for use with a bag pickup station comprising in combination, a base,

an alignment station on said base and including a bag edge locator having a first and a second alignment member interconnected in generally a V configuration,

a bag holder movable relative to said base toward and away from the open V end of said alignment members,

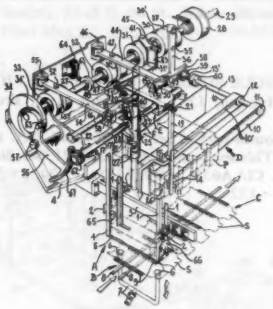
means including resilient means and a first motor acting between said bag holder and said base to actuate said bag holder between a preliminary position and a bag edge locator position,

and control means connected to control said motor and bag holder to actuate the bag holder for support of a bag thereby, to control said first motor to move said bag holder from said preliminary position to said bag edge locator position whereat an edge of the bag is moved into the open V end between the first and second alignment members to abut the closed V end under the urging of said resilient means.

3,953,021
APPARATUS FOR ACCUMULATING AND SUPPLYING SHEETS

Enzo Seragnoli, Bologna, Italy, assignor to G. D Societa per Azioni, Bologna, Italy

Continuation of Ser. No. 476,305, June 4, 1974, abandoned.
This application May 23, 1975, Ser. No. 580,302
Claims priority, application Italy, July 31, 1973, 3455/73
Int. Cl.² B65H *1/30*
U.S. Cl. 271—3.1 5 Claims



1. An apparatus for accumulating and supplying sheets, comprising;

a chute receptive of sheets to be dispensed therefrom and which normally lie transversely of the chute;

means for individually dispensing sheets from a base of the chute, including first conveyor means for removing them to a wrapping mechanism of a packeting machine in rhythmic succession;

an intermittently horizontally and vertically movable support device placeable in vertical alignment with the chute, above the same;

second conveyor means for conveying in an inching fashion, towards the support device, a plurality of piles of sheets, side by side;

centering and transfer means for handling whichever pile of sheets is, at any particular moment, closest to the support device to first move the pile in a first direction, lining it up with respect to the chute and then, in a direction at a right angle to the first, to transfer it to the support device;

power means for intermittently horizontally and vertically moving the support device and for intermittently operating the first and second conveyor means and the centering and transfer means; and

feeler means sensitive to a lever of a pile of sheets in the chute, for actuating the power means to enable the individual piles to be transferred in succession from the second conveyor means to the support device and from the latter to the inside of the chute when said level has been reached in the container.

3,953,022
SHEET COUNTER

Takeo Oshima, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 328,076, Jan. 30, 1973, abandoned.
This application Jan. 27, 1975, Ser. No. 544,583
Claims priority, application Japan, Jan. 31, 1972, 47-11215
Int. Cl.² B65H *3/10*
U.S. Cl. 271—95 5 Claims

1. An automatic sheet counting apparatus, which comprises:

sheet holding means comprising a support member for holding a stack of sheets, a holding member for securing said stack of sheets against said support member, and a first lever member to which said holding member is pivotally connected about a first pivot at one end thereof, said first lever member being itself pivotable about said first pivot from a sheet stack loading position through an intermediate position to a sheet stack counting position;

sheet counting means including at least one suction head means for separating a sheet from said sheet stack when the latter is in said sheet stack counting position;

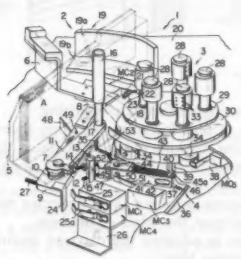
first spring means for rotating said first lever member and said support member from said sheet stack loading position to said intermediate position;

second spring means for rotating said support member from said intermediate position to said sheet stack counting position adjacent said suction head;

drive means for rotating said sheet counting means in a forward or reverse direction;

vacuum pump means for creating a predetermined vacuum required for said suction head means in order to successively separate sheets held by said support means;

means for adjusting the position of said suction head relative to said sheet stack prior to the activation of said vacuum pump means, said adjusting means including a second lever member pivotable about a second pivot near one end thereof, a click member located at the distal end of said second lever member for locking engagement with a slot in said sheet counting means when said suction head is properly positioned relative to said sheet stack, said second lever member being pivotable about said second pivot by said first lever member when the latter is moved from said intermediate position to said sheet stack



loading position, and third spring means for biasing said second lever member out of said locking engagement when said first lever member is in said sheet stack counting position; and

electrical circuit means for automatically controlling the operation of said position adjusting means, said vacuum pump means, said drive means, and said sheet counting means, said electrical circuit means comprising a first normally closed switch which is opened by said first lever member only when in said sheet loading position, a second normally open switch which is closed by said first lever member only when in said sheet loading position, a third normally open switch which is closed by said second lever member only when the latter is out of said locking engagement, a fourth normally open switch which is closed by said first lever member while moving between said intermediate position and said sheet counting position, a fifth normally open switch which is closed periodically by the forward rotation of said sheet counting means, and a sixth normally open vacuum valve switch which is closed upon the establishment of said predetermined vacuum; the closure of said second and third switches causing said drive means to rotate in said reverse direction, the closure of said first and fourth switches activating said vacuum pump means, the closure of said sixth switch causing said drive means to rotate in said forward direction, the closure of said fifth switch activat-

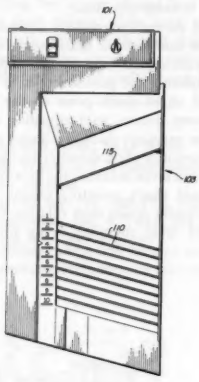
ing a counter for recording the number of sheets successively separated from said stack, the subsequent opening of said fourth and sixth switches causing said drive means and said vacuum pump means to cease operating.

3,953,023

BIN INDICATOR DEVICE

Thomas R. Cross, Rochester, and Clifford L. George, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 9, 1974, Ser. No. 530,907
Int. Cl.² B65H 31/24
U.S. Cl. 271—173 5 Claims



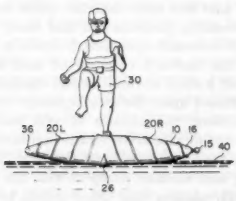
1. Sheet sorting apparatus comprising:
a plurality of bins for receiving copy sheets, each of said bins having marking indicia associated therewith,
transport means for advancing sheets along a path past the inlets of the bins,
carriage means including sheet deflector means adapted to be moved past the inlets of the bins,
drive means to advance the carriage means past the inlets of the sorting bins,
said carriage means including a bin indicator member positioned adjacent said sheet deflector means to become aligned with the marking indicia of each bin as said carriage means advances to indicate the last bin receiving a copy sheet.

3,953,024

WATER TUMBLER AND ROLLER FLOAT

Leonard M. G. Brubacher, West Montrose, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 6, 1975, Ser. No. 539,007
Int. Cl.² B63B 35/72
U.S. Cl. 272—1 E 3 Claims



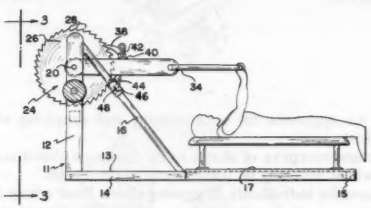
1. A hollow float which may be utilized in water to simulate the art of log-rolling by a user standing on the float, comprising
a float in the form of a semi-rigid skin enclosing a hollow interior which interior may be inflated with air or other gas to form a resilient body of a generally circular cross-section, with the length of the body being greater than the maximum diameter of the cross-section so as to form a cigar-like shape when inflated, with
projections integrally fitted to the skin, said projections shaped in the form of a helical thread so as to provide axial movement to the inflated float when the float is rotated in the water.

3,953,025

MUSCLE BUILDING EXERCISE DEVICE

Martin S. Mazman, 1251 N. Fancher Ave., Fresno, Calif. 93712

Continuation-in-part of Ser. No. 767,247, Oct. 14, 1968, abandoned. This application Mar. 25, 1971, Ser. No. 127,870
Int. Cl.² A63B 23/04, 23/00, 21/20, 21/22
U.S. Cl. 272—132 13 Claims



1. A muscle building exercise device comprising:
a frame having a pair of spaced parallel frame arms;
brake means connected to said frame for resisting the force exerted by a user, said brake means including action means for responding to force exerted by a user, said action means having a unitary axle defining a central axis and mounted between said frame arms and a brake member mounted on said axle and said brake member being movable with respect to said frame arms both rotatably about said central axis and axially therealong and said brake member having a pair of oppositely disposed face surfaces substantially normal to said central axis, and said brake means further including a pair of braking plates each connected to said frame, each of said braking plates having a brake member engaging surface and each engaging surface having an area substantially less than one-half the area of one of said brake member face surfaces and positioned juxtaposed a different one of said face surfaces for frictional engagement therewith at a spot thereon radially offset from said central axis, said braking plates having mutually aligned axes and being positioned in said frame to engage each of said face surfaces with their mutually aligned axes radially offset from said central axis;
user input means operatively associated with said frame and movable with respect thereto so as to transfer energy exerted by a user during an exercise program, said user input means having a lever arm with a proximal end connected to said axle and pivotally movable with respect to said axle and about said central axis and said lever arm having a distal end with user contact means thereon for receiving the force exerted by a user;
and connecting means for drivingly interconnecting said user input means and said brake means so as to transfer the force asserted by a user from said user input means to said brake means, said connecting means including rachet gear means integrated with said action means into a unitary structure and pivotally mounted pawl means con-

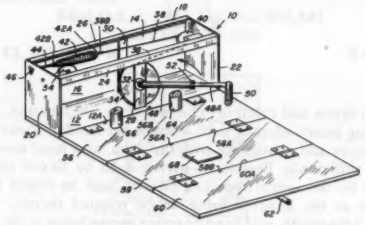
nected to said user input means lever arm, said pawl means being disposed to engage said rachet gear means and rotatably drive said brake member upon movement of said user input means lever arm in a first direction and to disengage from and pass over said rachet gear means upon movement of said user input means lever arm in a second direction.

3,953,026

ARM WRESTLING EXERCISE MACHINE

William R. Stokely, 5548 E. 46 St., Tulsa, Okla. 74135

Filed May 22, 1975, Ser. No. 580,052
Int. Cl.² A63B *21/22*
U.S. Cl. 272—140 **7 Claims**



1. An apparatus for practicing arm wrestling, comprising:
an elongated frame having a bottom, a top, a front side, a rear side, a left end and a right end;
a shaft pivotally supported within the frame parallel and intermediate the frame ends and parallel and intermediate the top and bottom;
an arm affixed at one end to said shaft, the arm being pivotally secured to said shaft in the plane of said shaft and non-rotatable relative to said shaft in the plane perpendicular said shaft;
a sheave affixed to said shaft and rotated by rotation of said arm;
a cable having one end affixed to said sheave at the periphery whereby the cable is wound on said sheave by the movement of said arm;
an extension spring having one end attached to the other end of said cable, and the other end attached to said frame, and
a hand bar pivotally attached to said arm outer and, said hand bar being pivotal in the plane of said arm and non-pivotal in the plane perpendicular said arm, the said spring being stretched by the pivotation of said arm.

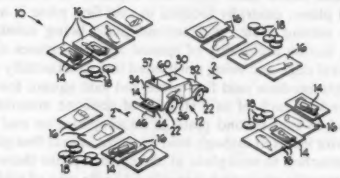
3,953,027

CARD MATCHING APPARATUS INCLUDING DISPENSER

Allison W. Katzman, Chicago, and Gordon A. Barlow, Skokie, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 12, 1975, Ser. No. 549,433
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 R **9 Claims**

1. A game apparatus comprising, in combination:
a first set of playing pieces distributable in given numbers to plural players of the game, with different indicia on at least some of said first set of playing pieces;
a second set of playing pieces being visually distinguishable from said first set of playing pieces, with indicia on at least some of said second set of playing pieces corresponding to the indicia on said first set of playing pieces whereby the players attempt to match one of the second set of playing pieces with one of the first set of playing pieces;
a dispensing device for holding a plurality of said second set of playing pieces and a manually actuatable member movable between a receiving and dispensing position for dispensing the playing pieces only one at a time; and



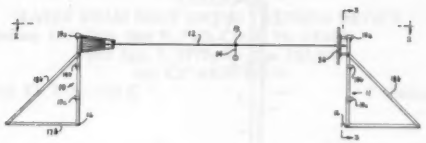
a plurality of payment playing pieces disposable into said dispensing device by the players of the game in payment for one of said second set of playing pieces.

3,953,028

TETHERED BALL BASEBALL BATTING PRACTICE DEVICE

Tim Gowins, 10034 Antrim, La Porte, Tex. 77571

Filed Apr. 5, 1974, Ser. No. 458,231
Int. Cl.² A63B *69/40*
U.S. Cl. 273—26 EA **6 Claims**



1. A baseball batting practice device comprising; a pair of spaced apart, substantially vertical support frames and an elongated high strength guide wire, horizontally extending and being supported at a desired height at each extremity by one of said support frames, said support frames being anchored to a suitable base; a slide-bushing captive to and slidable along said guide wire, and a tether line having one of its ends attached to said slide-bushing and a ball attached to its other end, said tether line and ball being movable along said guide wire with said slide-bushing, said guide wire having means to fixedly secure its extremities to said support frame, one of said support frames has a rebound board assembly and the other support frame has a wire tensioning assembly, one of said guide wire extremities being attached to said rebound board assembly and the other extremity being attached to said tensioning assembly; said tensioning assembly includes a vertically positioned substantially square frame having substantially equal length angle irons, each angle iron having first and second legs, the angle irons being connected together at their ends, two of said angle irons are vertically standing spaced apart and parallel and two of said angle irons are in a horizontal position spaced apart and parallel; the first leg of each angle iron projects outwardly of said frame, all first legs being positioned in a common vertical plane, the second leg of each angle iron being positioned substantially perpendicular to each first leg in said common vertical plane, said second leg of each said angle irons being provided with a plurality of spaced apart apertures and having a plurality of hooks inserted therein, each hook being for anchoring one end of a strand of resilient material thereto; a substantial distance from said vertical plane of said vertically positioned substantially square frame are two spaced apart, vertically positioned angle irons of lesser length than the angle irons of said square frame, said two angle irons being in a plane parallel to the plane of said square frame; extending from each corner of said square is an angle iron, one end of each last mentioned angle iron

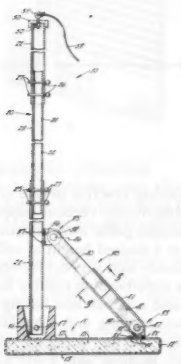
being attached to a corner of said square frame, and the other end of said last mentioned angle iron being attached to an end of one of said two angle irons to form a spring cage assembly; connecting said two angle irons of lesser length is a first plate comprising two plates of equal dimension and positioned above and below each other and coplanar in a substantially vertical plane, centrally located in said first plate is an aperture, a second plate; said second plate being substantially square, having a plurality of spaced apart apertures along its peripheral edge and being positioned in a substantially vertical plane intermediate said first plate and said square frame, the other end of each of said strands of resilient material being attached to said second plate at an aperture; an end of said guide wire inserted through said aperture in said first plate and being attached to said plate at the control point thereof; said first outwardly projecting legs of said angle iron of said square frame being means for anchoring said tensioning assembly to a vertical support frame.

3,953,029

BOTTOM LEVELING WATER BALL APPARATUS

Charles N. Boyd, 510 S. Broder, Anaheim, Calif. 92804

Filed Nov. 20, 1974, Ser. No. 525,570
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 A **6 Claims**



1. Apparatus for use in playing a game in a swimming pool or other body of water having a non-level bottom, comprising:

a base member adapted to be positioned on said bottom of said body of water, said base member having a cavity on the upper side thereof;

an elongate pole, one end of said pole extending into said cavity, said cavity being elongated laterally in one direction to permit movement of said one end of said pole in said one direction;

a pin extending across said cavity perpendicular to said one direction and through said one end of said pole for pivotably supporting said pole about an axis of rotation defined by said pin for permitting limited angular movement of said pole relative to said base member in said one direction;

adjustable means operatively connected between said pole and said base member for locking said pole in a desired angular position relative to said base member whereby said pole may be positioned vertically, regardless of the angle of said base member;

means for adjusting the length of said pole; a game device; and

means for connecting a game device to the other end of said pole.

3,953,030

THROW AND CATCH TOY

Bruce Muchnick, 9855 Bonner St., Philadelphia, Pa. 19115

Filed Jan. 14, 1975, Ser. No. 540,938
Int. Cl.² A63B *71/02*
U.S. Cl. 273—95 R **9 Claims**

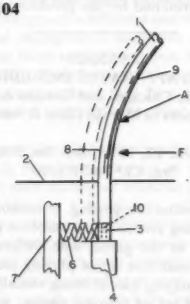
1. A throw and catch toy comprising in combination, hand covering means adapted to be worn on the hand of a user over the fingers and contiguous with the palm, said hand covering being sufficiently flexible to permit it to be flexed slightly closed by the user's fingers, if desired, and an object to be thrown at the hand covering, to be trapped thereby upon contact therewith, said hand covering means being in the form of an inflatable glove having a palm side providing a surface area thereon including one component of a two component fastening system, said two component fastening system comprising a first component including a plurality of loop elements projecting therefrom and a second component including a plurality of hook elements projecting therefrom, said first and second components being arranged to be releasably secured to each other upon contact, said object having a surface portion including the other component of said two component fastening system, whereupon when said object is thrown at the hand wearing the hand covering means and makes contact therewith the component on the hand covering means coacts with the component on the object to catch the object thereon without requiring the user to use his fingers to grasp the object to effect said catching but permitting some finger control in said catching, if desired.

3,953,031

YIELDABLE HORSESHOE STAKE

Vernon Kinser, Jenkins, Mo. 65677

Filed Feb. 10, 1975, Ser. No. 549,015
Int. Cl.² A63B *67/00*
U.S. Cl. 273—104 **5 Claims**



1. A target for missiles impelled thereagainst comprising a support base, a stake having a lower end portion received within said base and an upper, target-forming portion projecting above said base, swingable mounting means located within said base and comprising an arm having a free end engaged to

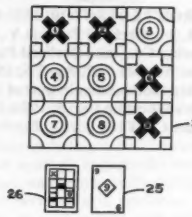
the lower end portion of said stake within said support base and being in axially perpendicular relationship thereto, means hingedly engaging the stake-remote end of said arm, and resilient means engaging said stake rendering same yieldable in a direction substantially coincident with the path of travel of said missle and urging same into target position, said upper target forming portion of said stake being formed on a radius developing a concave-convex contour with the concave side presented in a direction toward the path of travel of missiles impelled against said target.

3,953,032

INDEPENDENTLY REVERSIBLE SEGMENTS AND RANDOM SELECTION MEANS THEREFOR

Sheldon John Moore, 1749 New Hampshire Ave., Los Angeles, Calif. 90029, and Larry S. Day, 1460 Temple St., Los Angeles, Calif. 90026

Filed Oct. 4, 1973, Ser. No. 403,541
Int. Cl.² A63F *3/00*
U.S. Cl. 273—135 R **5 Claims**



1. A game comprising:

a plurality of like, discrete, and independently reversible playing segments each having substantially planar obverse and reverse faces, said obverse and reverse faces of each of said segments bearing indicia means to at least define a sequential numbering of said segments, said segments being adapted to be placed on a planar supportive surface in a two dimensional polygonal array defining a playing surface;

said indicia means further including on each said obverse side identical first indicia and on each said reverse side identical second indicia distinct from said first indicia, and first and second indicia distinguishing said obverse and reverse sides;

a random selection means including a plurality of different selectible items, a plurality of said items bearing an indicium of number corresponding to said numerical indicia means of a particular said segment, a said item to be randomly selected to initiate reversal of its corresponding said segment.

3,953,033

GOLFER'S PUTTING STANCE ANALYZING DEVICE

Norman A. Kelly, 1514 Country Club Drive, Warsaw, Ind. 46580, and Norris R. Libert, 501 Center St., Jupiter, Fla. 33458

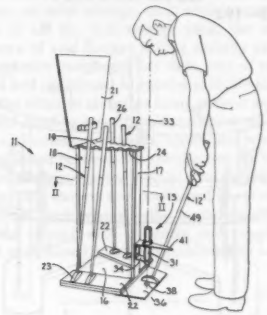
Filed Oct. 10, 1974, Ser. No. 513,840
Int. Cl.² A63B *69/36*
U.S. Cl. 273—183 E **6 Claims**

1. A device for determining the proper shaft angle for a putter, comprising:

stationary base means having a substantially horizontal plate adapted to be disposed on the floor, said plate having an alignment mark thereon;

vertical sighting means mounted on said base means and spaced upwardly from said plate, said sighting means being vertically aligned with said mark;

said vertical sighting means comprising an elongated hollow tube positioned vertically and defining a vertical line of sight which is substantially aligned with said mark, said tube having the lower end thereof spaced upwardly from said plate; and



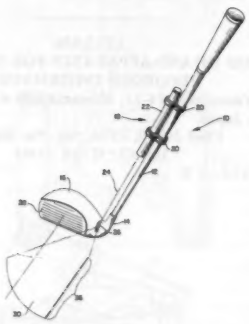
means coacting with said sighting means for determining the angle of a putter shaft relative to the vertical when the putter head is located adjacent said mark.

3,953,034

LASER BEAM GOLF SWING TRAINING DEVICE

Rodney L. Nelson, Box N, Falls Creek, Pa. 15840

Filed Apr. 7, 1975, Ser. No. 565,946
Int. Cl.² A63B *69/36*
U.S. Cl. 273—186 C **7 Claims**



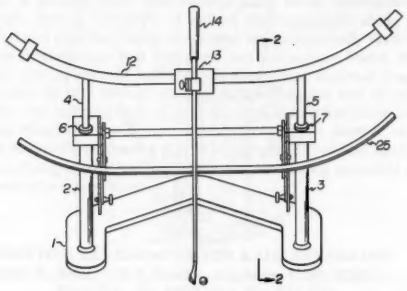
1. A golf swing training device for visually indicating to the golfer the precise angular disposition of the golf club head with respect to the golf ball at least at impact, as contact between the two is made, comprising: a source of narrow, strong pencil beam of light projected downwardly substantially parallel to the axis of the golf club shaft, said source being rigidly disposed with respect to the golf club shaft and light dispersal means arranged for disposition adjacent the face of the golf club for converting said pencil beam of light into a dispersed fan of light projecting in substantially a vertical plane forwardly from the golf club face at substantially a 90° angle thereto, at least a portion of said dispersed fan of light being projected downwardly onto the ground just before, at the moment of impact of golf club and ball during a golf swing, and slightly afterwards, whereby a visually perceivable, narrow line of light appears on the ground in front of the golf ball to inform the golfer the precise angular disposition of golf club face and ball as the ball is struck.

3,953,035

GOLF CLUB SWING TRAINING DEVICE

John Beckisk, 228 W. Mitchell St., Milwaukee, Wis. 53204

Filed Dec. 2, 1974, Ser. No. 528,914
Int. Cl.² A63B 69/36
U.S. Cl. 273—192 7 Claims



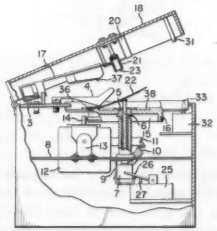
1. A golf pitch and putt swing training device comprising: a base frame; vertical standards fixed to said base frame; vertical rods in the standards movable vertically for height adjustment; pivot fittings at the top of said rods for inclination; a guide track linear in the center portion and curved upwards at the end portions in one plane only fixed on said pivot fittings; a guide mechanism engaged with said guide track; and a support track, similar in configuration to the guide track, located approximately parallel to and below the guide track, mounted on pivotable clevises supported by pivotable arms which are attached to said vertical standards.

3,953,036

METHOD OF AND APPARATUS FOR REPRODUCING RECORDED INFORMATION

Hiroshi Yamamoto, 14-11, Shimotakaido 4-chome, Suginami, Tokyo, Japan

Filed July 8, 1974, Ser. No. 486,455
Int. Cl.² G11B 25/04
U.S. Cl. 274—9 R 8 Claims



1. An apparatus for reproducing information recorded on a nonapertured rectangular thin sheet, said apparatus comprising:

a cabinet;

a lid pivotally connected to one edge of said cabinet;

a turntable positioned at an upper portion of said cabinet and including means for grasping the four corners of a sheet;

a motor including an output shaft and mounted for movement toward and away from said turntable;

guide member means for slidably guiding a sheet onto said turntable;

a rod member provided centrally of said turntable and normally biased upwardly therethrough;

first and second switch means connected in series with each other and said motor thus forming circuit means for actuating said motor only when both said switch means are closed;

said first switch means being provided on an edge of said lid and actuable only when said lid is completely lowered to a closed position thereof;

said second switch means being provided below said rod member and actuated by downward movement of said rod member only if a sheet is positioned on said turntable;

a cylindrical member rotatably connected to the underside of said lid at a position opposite said rod member and comprising means for pressing said sheet toward said turntable and for thus moving said rod member downwardly; and

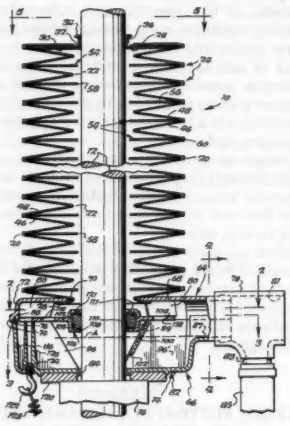
a pickup arm including a reproducer stylus.

3,953,037

POLISHED ROD PROTECTOR AND RECEIVER

Mason C. Winfield, Jr., Orchard Park, N.Y., assignor to Rodgard Manufacturing Co., Inc., Orchard Park, N.Y.

Division of Ser. No. 348,702, April 6, 1973, Pat. No. 3,886,804, which is a continuation-in-part of Ser. No. 249,261, May 1, 1972. This application Dec. 5, 1974, Ser. No. 529,751
Int. Cl.² F16J 15/52, 15/18
U.S. Cl. 277—30 9 Claims

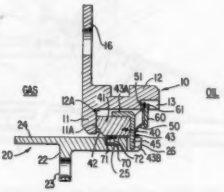


1. A liquid receiving container comprising, in combination with a reciprocable rod passing therethrough, a housing having a top wall, a bottom wall and a side wall, said top and bottom walls being provided with aligned openings for receiving said rod therethrough, a resiliently yieldable rod wiper element in wiping engagement with said rod, mounting means affixed to said wiper element, and means supporting said mounting means in said housing for lateral movement therewithin and restrained axial movvement relative to said rod thereby enabling said wiper element to accommodate lateral shifting and wobbling of said reciprocating rod.

3,953,038
FLUID SEAL FOR ROTATING SHAFTS

Lawrence P. Ludwig, Fairview Park, Ohio, assignor to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Feb. 19, 1975, Ser. No. 551,184
Int. Cl.² F16J *15/34*
U.S. Cl. 277—93 R **7 Claims**

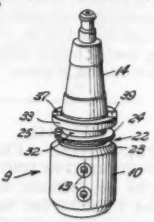


1. A liquid-gas seal for a rotating shaft comprising an outer annular stationary member including an inwardly projecting portion defining radial extending annular sealing surface; an inner annular rotating member which rotates with the rotating shaft; an annular sealing ring disposed between said stationary member and said rotating member and including key means for keying said sealing ring to said rotating member, said sealing ring further including a radial extending annular sealing surface which sealingly engages the sealing surface of said stationary member; and substantially stationary annular spring means, disposed between said stationary member and said rotating member in engagement with said sealing ring, for providing an axial force against said sealing ring so as to maintain sealing contact between said sealing surface of said stationary member and the sealing surface of said sealing ring.

3,953,039
TOOLHOLDER FOR MACHINE TOOLS

Robert Z. Hauge, Oradell; George J. Loos, Parsippany, both of N.J., and Matthew F. Marsicano, Forest Hills, N.Y., assignors to Textron Inc., Providence, R.I.

Division of Ser. No. 501,865, Aug. 30, 1974. This application Apr. 9, 1975, Ser. No. 566,394
Int. Cl.² B23B *5/22;* **B23Q** *1/00*
U.S. Cl. 279—1 TS **1 Claim**

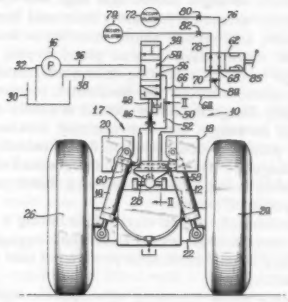


1. For use with a machine tool having a spindle provided with a driving key, a tool storage rack having a plurality of open tool-receiving sockets and transport means including a carriage having an open toolholderreceiving socket for transferring the toolholder between said storage rack and said spindle, each said socket having a tool locating key, the toolholder having a body portion having at one end means to receive and hold the shank of a working tool, at the other end a mounting portion shaped to fit a corresponding cavity in the nose of a spindle, and an intermediate portion of the body having two spaced flanges forming two axially spaced annular grooves between said body portion and said mounting portion, one of said grooves being positioned and shaped to receive toolholder-supporting means on said carriage and the other of said grooves being positioned and shaped to receive the edges of one of said plurality of tool-receiving sockets in said tool storage rack to support the toolholder therein, said flanges being axially spaced whereby one of said grooves may receive said toolholder-supporting means on said carriage at the same time that the other of said annular grooves receives said toolholder means on said storage rack while moving the toolholder onto or off the tool storage rack, the improvement comprising one of said flanges having radially extending diametrically opposite peripheral key slots, one of said key slots being shaped and positioned to receive said driving key on the spindle and the other of said slots being shaped and positioned to receive said holding key on said transport means to maintain the circular orientation of the toolholder while the latter is being transported between the spindle and the rack, and the other of said flanges having solely one radially extending peripheral key slot shaped and positioned to receive a key on said tool storage rack whereby the toolholder may be positioned on said storage rack in solely one circular oriented location and maintained in such location while supported on said rack.

3,953,040
LEVELING AND LOCKUP SYSTEM FOR WHEEL TRACTOR SUSPENSION SYSTEM

Dale H. Unruh, Peoria, Ill., and Jan B. Yates, Reynoldsburg, Ohio, assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 5, 1975, Ser. No. 555,655
Int. Cl.² B60G *11/26*
U.S. Cl. 280—6 H **11 Claims**



1. A suspension system for a vehicle having a vehicle frame and an axle, comprising:

means interconnecting the vehicle frame and axle for providing that the axle is movable generally toward and away from the vehicle frame, and rotatable about an axis disposed generally longitudinally of the vehicle;

sensing means for determining relative positioning of the axle generally toward and away from the vehicle frame;

leveling means responsive to said sensing means for positioning said axle relative to the frame generally toward and away from the vehicle frame upon determination by the sensing means of positioning of the axle relative to the vehicle frame generally toward and away from said vehicle frame;

ride cushioning means for cushioning movement of the axle generally toward the vehicle frame; and

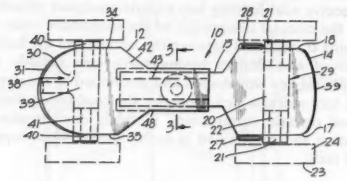
means selectively actuatable to deactivate said ride cushioning means, and actuatable to activate the ride cushioning means;

3,953,041

LARGE WHEEL ROLLER SKATE

Herman Buss, Carrollton, Tex., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 6, 1975, Ser. No. 547,719
Int. Cl.² A63C 17/02, 1/26
U.S. Cl. 280—11.26 3 Claims



1. A roller skate, which comprises:

a. a toe supporting section having a rectangularly shaped forward toe platform joined integrally to a forward first shank member of a rectangular bar shaped configuration, a bottom base of said first shank member having a threaded aperture therein;

b. a first axle assembly communicating with an underside of said forward toe platform;

c. a heel supporting section formed from a planar rear heel platform having a curved rear edge and a second shank member extending forwardly from said heel supporting section, said second shank member including an elongated rectangularly shaped plate, a pair of L-shaped flange members extending downwardly from each side of said plate, wherein the horizontal portions of said L-shaped flange members extend inwardly towards each other forming a gap between said horizontal portions, said plate and said L-shaped flange members defining a rectangularly shaped channel therein, and said first shank member being slidably contained within said rectangularly shaped channel;

d. a horizontally placed clamp plate having a central opening therethrough, said clamp plate engaging a bottom surface of said horizontal portions of said second shank member;

e. a wing screw extending upwardly through said central opening of said clamp plate to threadably engage said threaded aperture in said first shank member said first shank member and said clamp member frictionally engaging said horizontal portions of said second shank member as said wing screw threadably engages into said threaded aperture of said first shank member;

f. a heel guard portion extending upwardly from said curved rear edge of said heel supporting section;

g. a second axle assembly communicating with an underside of said planar rear heel platform;

h. a pair of large plastic wheels communicating with each said first and second axle assemblies, said axles extending through said wheels;

i. a pair of first strap bracket members joined to said toe platform;

j. a pair of second strap bracket members joined to said heel platform, said second strap members extending downwardly from a rear portion of straight side edges of said heel platform;

k. strap members extending through said first and second strap bracket members; and

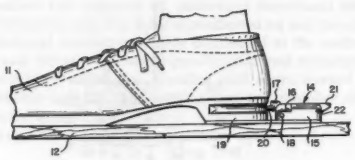
l. a clamp member affixed onto an end of each said axle, each said clamp member being positioned outside of each said wheel.

3,953,042

TOURING SKI BOOT HEEL BINDING

Ewald D. Pyzel, and Harold E. Codding, both of Reno, Nev., assignors to Ski Safe Inc., Carson City, Nev.

Filed Dec. 23, 1974, Ser. No. 536,971
Int. Cl.² A63C 9/08
U.S. Cl. 280—631 4 Claims



1. A touring ski boot heel binding adapted to be mounted on the upper surface of a touring ski and to releasably engage the heel of a touring ski boot which comprises:

a frame adapted to be secured to the upper surface of a touring ski;

a rotatable heel latch pivotally mounted on the frame, said heel latch being rotatable forwardly to its forwardmost position at which position it is adapted to engage the heel of a touring ski boot and being rotatable rearwardly to its rearwardmost position at which position it is out of engagement with the heel of said ski boot; and

latch engagement and disengagement means for maintaining the heel latch in engagement with the heel of the ski boot when the heel latch is at its forwardmost position and for maintaining the heel latch out of engagement with the heel of the ski boot when the heel latch is at its rearwardmost position, said latch engagement and disengagement means comprising an operating lever pivotally mounted on the frame rearwardly of the rotatable heel latch, a connecting link pivotally connected to the heel latch above the axis of rotation of the heel latch and also pivotally connected to the operating lever forwardly of the axis of rotation of the operating lever, and a spring loaded piston mounted on the frame rearwardly of the heel latch and also pivotally connected to the heel latch below the axis of rotation of the heel latch;

rotation of the operating lever rotating the heel latch to its forwardmost position and to its rearwardmost position, and said spring loaded piston urging the rotatable heel latch to its rearwardmost position.

3,953,043

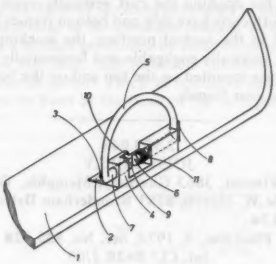
DEVICE FOR PREVENTING A CROSSING OF SKIS DURING SKIING

Hans Hinterholzer, Nr. 36, Saalbach, Austria

Filed Oct. 15, 1974, Ser. No. 515,062
Claims priority, application Austria, Oct. 19, 1973, 8900/73
Int. Cl.² A63C 11/00
U.S. Cl. 280—11.37 E 10 Claims

1. An anti-crossing device for a ski comprising, in combination, a base plate having stop means thereon, means for mounting said base plate on the upper surface of a ski, a locking member, means for mounting said locking member on said base plate for pivotal movement along a path, means for yieldingly urging said locking member pivotally in one direction against said stop means to position said locking member in a vertically extending, operative position to provide a barrier against the overcrossing of another ski adjacent thereto, said locking member being pivotally movable against said urging means in the opposite direction by an overcrossed ski to permit uncrossing of the skis and means for disengaging said locking member from said stop means to permit said

locking member to be moved pivotally by said urging means in said one direction to position said locking member in a



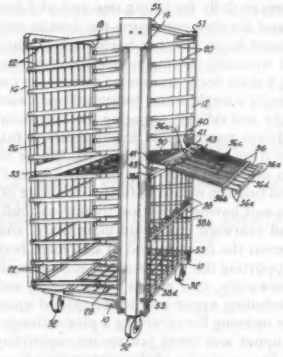
storage position in overlying relationship with the associated ski.

3,953,044

BULK MAIL TRANSPORTER

James D. Wilson, Newport Beach, Calif., assignor to Banner Metals Division of Intercole Automation, Inc., Compton, Calif.

Filed Mar. 28, 1975, Ser. No. 562,830
Int. Cl.² B62B 11/00
U.S. Cl. 280—33.99 H 4 Claims



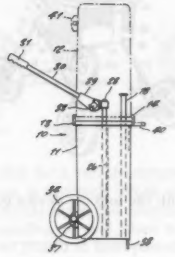
1. A rack comprising: a lower U-shaped horizontal frame member having a rear member and side members which diverge outwardly from the rear member and defining an open front; a plurality of spaced and parallel upright posts mounted on said frame member at the front and rear thereof; a rectangular-shaped intermediate shelf having a forward edge and a rear edge; hinge means attached to the rear edge of the intermediate shelf and supported on the posts to permit the intermediate shelf to be upwardly turnable to an upright position to permit other like racks to be received in the open front of the rack; and upper and lower gate members individually pivotally mounted to the forward edge of the intermediate shelf and turnable from positions adjacent the intermediate shelf when the intermediate shelf is in its upright position to positions enclosing the open front of the rack when the shelf is turned down to a horizontal load supporting position in which the upper gate encloses the area above the intermediate shelf and the lower gate encloses the area below the intermediate shelf.

3,953,045

FERRETT BAG AND CART

Valentine G. Feret, Jr., 7095 Valleygreen, Washington, Mich. 48093

Filed Mar. 20, 1975, Ser. No. 560,502
Int. Cl.² B62B 1/12
U.S. Cl. 280—638 3 Claims



1. In a golf equipment carrier having a bag, said bag comprising a lower body and an upper body, said bodies being made of plastic material and each being hollow to enclose golf playing equipment, said upper body being removably placeable upon said lower body, a separator and lower track provided upon an upper edge of said lower body and an upper track being provided upon a lower edge of said upper body, said lower body being supported upon a pair of wheels for traveling across a ground, said lower body having a pair of forwardly extending brackets upon its front side, said brackets supporting an axle which at each end is inserted through the center of said wheels, and an underside of said lower body also being provided with a cart rest for maintaining said lower body in vertical, upstanding position while at rest, said lower body including a main post at its center and extending vertically upwardly to a top of said lower body, and an upper end of said main post having an adjustable handle assembly secured pivotally thereto, said handle assembly including a straight handle which at its outer end is fitted with a handle bar grip, said handle assembly being pivotable between a sideward extending position and a vertical, upright position for fitting under said upper body.

3,953,046

FOLDING SPORT STROLLER OR THE LIKE

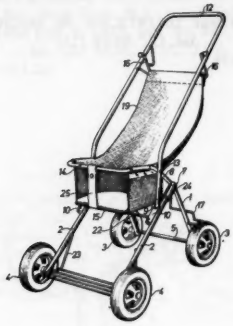
Leif Johansson, Bredaryd, Sweden, assignor to Baby Bjorn AB, Solna, Sweden

Filed Jan. 27, 1975, Ser. No. 544,409
Claims priority, application Sweden, May 17, 1974, 7406620
Int. Cl.² B62B 11/00
U.S. Cl. 280—644 14 Claims

1. A stroller comprising:

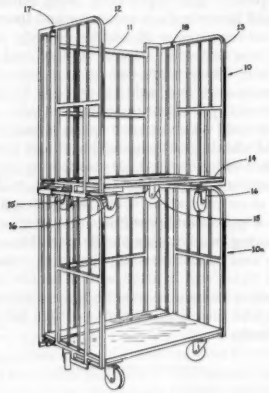
a pair of pivotally mounted legs, wheel means rotatably mounted to respective support ends of the legs, one of said legs extending upward beyond the pivot axis of the legs, a blocking lever pivotally mounted to said extension and defining a locking portion, a locking device fixed relative to the other leg and which may engage the locking portion, the extension, the portion of the blocking lever between said extension and the locking portion, and the portion of the other leg between the locking device

and pivot axis of the other leg generally forming a triangle which maintains the legs in a fixed position relative to



each other with the locking device engaging the locking portion.

3,953,047
COLLAPSIBLE STACKING CART
Lawrence M. Morgan, Anoka, Minn., assignor to The Cornelius Company, St. Louis Park, Minn.
Filed Feb. 25, 1975, Ser. No. 552,987
Int. Cl.² B62B *11/00*
U.S. Cl. 280—639 **19 Claims**



1. A collapsible, vertically stackable merchandise cart comprising:

a. a rear frame of upright rectangular shape;

b. a pair of upright rectangular side frames hingedly attached one to each side of the rear frame and pivotable from normal positions generally perpendicular to the rear frame to alternate storage positions;

c. support means disposed below and secured to the rear frame and each side frame respectively;

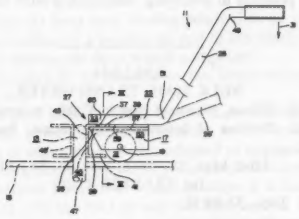
d. a horizontal axis hinge having a portion secured to one of the upright frames;

e. a bottom frame secured to another portion of the horizontal axis hinge and pivotable from a normally generally horizontal position for support of goods thereon to an upright storage position adjacent to the respective one upright frame;

f. latches mounted on side and bottom frames, which lock together and positively secure the side and bottom frames pivotably immovable in the normal positions, the cart being forkliftable by the bottom frame when latched and locked; and

g. means for stacking the cart vertically upon a like cart when both carts have side and bottom frames latched and secured in the normal position, the stacking means including vertically engagable and horizontally positioning abutments mounted on the top and on the bottom of the side and rear frames.

3,953,048
JOIST DOLLY
George D. Vincent, 3863 Guernsey, Memphis, Tenn. 38122, and Johnie W. Morris, 6281 Branderham Drive, Memphis, Tenn. 38134
Filed Dec. 9, 1974, Ser. No. 530,528
Int. Cl.² B62B *1/06*
U.S. Cl. 280—47.3 **11 Claims**

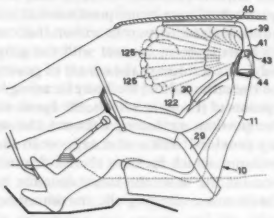


1. A leverage dolly for lifting one end of a long open web steel joist and for then conveying the joist to and fro along a steel structural beam member having a horizontally disposed web which normally restingly supports the joist, said dolly comprising a main body, transverse axle means carried by said main runningly a single wheel journaled upon said axle means for funningly and ridingly engaging the horizontal web of the structural beam member and for establishing fulcrum means to facilitate lifting one end of the joist, handle means fixedly attached to said main body to constitute a lever for cooperating with said fulcrum means to further facilitate lifting one end of the joist and having a portion thereof extending angularly upward and rearward from said main body, and means disposed adjacent the forward end of said main body for engaging and supporting the joist as said handle means is manually urged downwardly; said means for engaging and supporting the joist including upper and lower spaced apart jaw means defining an opening for receiving a planar flange portion of a joist, said upper and lower jaw means supportingly engaging the planar flange portion of the joist as the planes of said jaw means are tilted by manually urging said handle means downwardly.

3,953,049
INFLATABLE HEAD PROTECTOR
Filippo Surace, Milan, and Marco Garetti, Mariano Comense (Como), both of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy
Filed Mar. 7, 1974, Ser. No. 449,211
Claims priority, application Italy, Mar. 8, 1973, 21333/73
Int. Cl.² B60R *21/08*
U.S. Cl. 280—730 **12 Claims**

1. A device for the protection of the head on an occupant in a motor vehicle in the case of impact forces on the vehicle, said device comprising a protective strip having an extended operative position and a retracted inoperative position, said strip including a plurality of inflatable members, a casing retaining said strip folded on itself in said retracted position, said strip in said inoperative position extending along a substantially U-shaped line and having opposite ends with means

attaching said ends to a structure which is integral with the vehicle at two points situated on a horizontal axis extending transversely of the vehicle at a position behind and on opposite sides of the head of an occupant seated in said vehicle for unfurling said strip in its operative position to extend essentially along a surface generated by rotation of said U-shaped line around said axis, said inflatable members of the strip including lateral sectors which in operative inflated position are disposed in front of the head of the occupant to be contacted thereby and produce tensile stresses in said sectors passing substantially through said axis, the line of action of the resultant of said tensile stresses substantially coinciding with the center of gravity of the occupant's head, and means responsive to a preselected deceleration magnitude of the vehicle for inflating said inflatable members to expel said strip from said folded inoperative position in said casing to said unfurled operative position, said inflatable members during inflation undergoing rapid transition to the inflated condition while the strip is restrained at said ends.

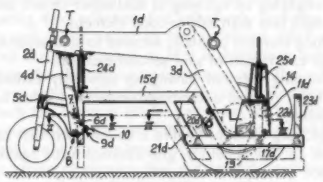


3,953,050

LONGITUDINAL MEMBER FOR THE CHASSIS OF A STRADDLE VEHICLE

Emile Bobard, Beaune, France, assignor to Bobard Jeune, Beaune, France

Filed Mar. 13, 1975, Ser. No. 558,077
Int. Cl.² B60R *11/00*
U.S. Cl. 280—760 **5 Claims**



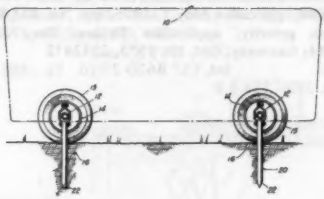
1. A device adapted to be mounted on each side frame of a straddle-chassis tractor having front and rear wheel-supporting legs having their upper portion braced by longitudinally extending means, comprising: support means fixedly attached to front and rear portions of each said side frame; guide means mounted to said support means; a longitudinally extending member bracing the lower portion of each side frame; and slide means on said member in sliding engagement with said guide means and cooperating therewith to allow said member to be raised and lowered relative to said side frame to thereby allow the attachment of implements to said tractor.

3,953,051

GROUND ANCHOR FOR LAND VEHICLES

Beulah B. Weathers, 605 6th Ave. East, Apartment A, Cordele, Ga. 31015

Filed Feb. 27, 1975, Ser. No. 553,481
Int. Cl.² B60S *9/02*
U.S. Cl. 280—763 **7 Claims**



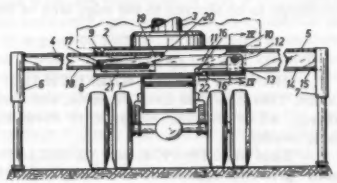
1. A ground anchor for a vehicle comprising, in combination, a stake having a relatively blunt end adapted to be pounded and a relatively sharp end adapted to be driven into ground upon a pounding of said blunt end; axle clamping means adapted to be placed at least partially about a vehicle axle; and fastening means for fastening said axle clamping means to said stake whereby movement of the vehicle relative to supporting ground terrain may be restricted when the stake is driven into the ground and the clamping means is placed about the vehicle axle and fastened to the stake; said clamping means comprising a pair of substantially identically shaped plates with each plate having three mutually parallel planar sections unitarily joined together by two linking sections.

3,953,052

SUPPORT LEGS OF MOBILE CRANES

Jan Birger Palmcrantz, Harmanger, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed Sept. 23, 1974, Ser. No. 508,058
Claims priority, application Sweden, Oct. 18, 1973, 7314177
Int. Cl.² B60S *9/12*
U.S. Cl. 280—763 **8 Claims**



1. An improvement in support legs intended for mobile cranes, said cranes including a vehicle chassis and a base supported by the vehicle chassis, said support legs comprising inner and outer jib sections arranged for telescopic displacement into each other and for movement into opposite ends of a crane base in a direction transverse to the vehicle chassis said inner and outer jib sections each having inner ends located within the base, said sections having an extended position in which said ends lie spaced within the base and a retracted position in which said sections are telescopically received within said base with said inner jib section telescopically received in said outer jib section, the improvement comprising a support arm, said inner jib section being displaceable into the base telescopically to receive said support arm, one end of said arm being supported adjacent to and by that side of said crane base where said support leg incorporating said outer jib section is positioned, the opposite end of said support arm abutting against the interior of the inner jib section, and

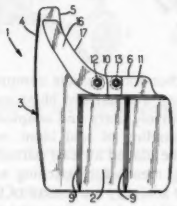
said support arm supporting at some point intermediate its two ends, that end of said inner jib section which is positioned inside said crane base.

3,953,053

MUD FLAPS FOR AUTOMOBILE FENDERS

Knut Arenhold, 5, Birkenweg, Kehl-am-Rhine, Germany

Continuation of Ser. No. 427,249, Dec. 21, 1973, abandoned.
This application May 2, 1975, Ser. No. 573,832
Claims priority, application France, Dec. 21, 1972, 72.47084; Germany, Oct. 19, 1973, 2352472
Int. Cl.² B62D *25/16*
U.S. Cl. 280—154.5 R 9 Claims



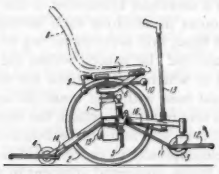
1. A mud flap for a fender of a vehicle, comprising:
a flange portion having an elongate outline generally conformable to an edge area of a vehicle's fender; a web portion integral with said flange portion; both of said portions having two surfaces generally parallel to one another;
a counter-flange secured to one of said portions and extending along an edge of one of said surfaces, defining an angle between the flange portion and the counter-flange, when not held to a fender, to match an inclination of the edge area of the fender from a vertical surface, for holding said portions to the fender and for keeping the web portion approximately vertical not-withstanding such inclination of the edge area; and
fastening means secured to one of said portions and to the counter-flange for enabling said portions and said counter-flange to be secured to the edge area of the fender.

3,953,054

HAND OPERATED WHEEL-CHAIR

Per Udden, Timra; Siegfrid Graf, Fagervik, and Bert Engman, Sorberge, all of Sweden, assignors to Permobilstiftelsen, Timra, Sweden

Filed Mar. 18, 1974, Ser. No. 452,147
Claims priority, application Sweden, Mar. 19, 1973, 7303826
Int. Cl.² A61G *5/00*
U.S. Cl. 280—242 WC 7 Claims



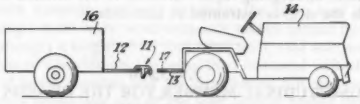
1. A hand-operated wheel-chair comprising in combination:
a pair of main wheels which are rigidly connected with the frame of the chair and at least one of which serves as driving wheel,
a pair of castor wheels which are pivotally connected with the frame of the chair, the seat of the said chair being disposed substantially halfway between the main wheels to locate the vertical through the center of gravity of the chair, by small positional changes of the seat for a person to sit thereon, ahead of as well as behind a line extending between the support points of the main wheels, when the chair is standing on a flat and horizontal ground surface,
a pair of support wheels being substantially non-pivotally connected with the frame, whereby said castor wheels and support wheels are being positioned at a level above said ground surface to permit either the castor or the support wheels to be in contact with the ground surface when said vertical through the center of gravity is located on one or the other side of the line extending between the support points of the main wheels, the frame comprising
a transverse portion, extending between the main wheels and being provided with a seat support in the form of a central column, which includes therewith position adjusting means for the seat, the inner distance between the main wheels not exceeding the maximum width of the seat.

3,953,055

OFF-HIGHWAY TRAILER HITCH

Allan P. Stark, Irwin, Pa., assignor to Robert L. McCormick and S. Ray Simon Associates Co., both of N. Huntingdon, Pa., part interest to each

Filed June 30, 1975, Ser. No. 591,427
Int. Cl.² B60D *1/04*
U.S. Cl. 280—504 7 Claims



1. A hitch assembly for use in association with an object to be drawn by another object, said assembly comprising
a horizontal member adapted to be secured to said object to be drawn,
said horizontal member having first and second spaced apart downwardly projecting elements,
said first element having a cross-section and region suitable for engaging an opening in said other object and having a length less than said second element,
a latching element pivotally secured to said second element in an end region of said second element,
said latching element having an upwardly extending arm having a portion extending transverse to said horizontal member,
said latching element having a length such that said transverse portion is held by gravitational force against an end region of said first element.

3,953,056

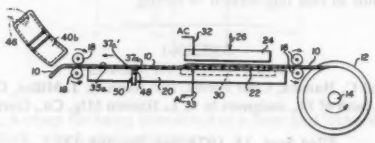
BOOKBINDING WITH PLASTIC COVERS

Alvin V. Roberts, Scarsdale, N.Y., assignor to Bookwrights, Inc., New York, N.Y.

Continuation of Ser. No. 261,513, June 9, 1972, abandoned.
This application June 18, 1974, Ser. No. 480,488
Int. Cl.² B42D *1/00*
U.S. Cl. 281—29 10 Claims

1. The method of binding a book which comprises making successive book covers, each in one operation in a single station from a portion of a preformed sheet of homogeneous synthetic high polymer thermoplastic material of higher pick

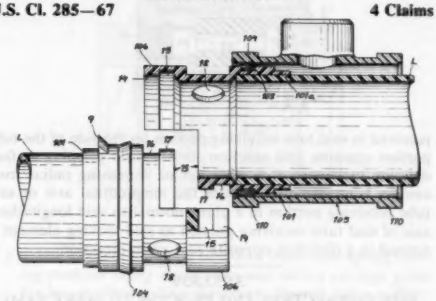
strength than paper, which method comprises supplying the synthetic high polymer as an elongated sheet of uniform thickness and in intermittent steps between confronting elements comprising a die and a base element having relative movement toward and from one another, the die having narrow rules projecting therefrom toward the base element, a first of said rules being a closed figure and being shaped to the outline of a cover that is to be severed from the elongated sheet, and other rules located within said figure and in position to form hinge lines for the cover, moving the first rule of the die into contact with the plastic sheet, continuing the movement of the first rule toward the base element and through a stroke that displaces the plastic for substantially the full thickness of the sheet around the outline of a cover, and also moving the other rules of the die into contact with the plastic to heat and displace the plastic of the sheet for a depth less than the depth of displacement of the first rule and for a depth dependent on the displacement of plastic by the first rule and at locations that provide hinge lines for the cover, intermittently moving the sheet material to advance it from under the die, and bringing a new portion of sheet material under the die, repeating the operation of the die through another cycle to make another cover after each movement of additional material into positions under the die, holding the successive covers in the sheet while advancing the covers and the plastic sheet together beyond the die and to a delivery station, separating each successive cover from the rest of the sheet along said outline of the cover at the delivery station, assembling and clamping leaves that make a book filler of a thickness substantially equal to the distance between the hinge lines of the cover, stabilizing the book filler by application of adhesive to the spine of the filler while the leaves are clamped in assembled relation, removing the clamps when the adhesive is set, trimming the stabilized filler to a height and width less than the height and width of the front and back cover panels so that the cover will overhang the edges of the leaves of the filler, then heating said adhesive for adhesively securing the high pick strength spine panel to the stabilized filler while the surface of the spine panel is at a temperature substantially lower than the deforming temperature and the spine panel remains in a solid, unfused state of the preformed plastic sheet from which the cover is made, and using an adhesive that is strong enough to bind the filler to the cover without end papers, said book covers being made from a sheet of material from the group of plastics that are heated by exposure to a high frequency electric field and that are of a composition that tears with a smooth tear along a tear line, exposing the sheet to a high frequency electric field by using said base element and the rules of the die as the electrodes of the high frequency field at said single station, and displaceing material in the sheet by pressure applied to the heated localized areas of the sheet between the electrodes of the high frequency electric field, reducing the thickness of the plastic along said localized areas to a thin section along which the cover can be torn from the sheet at the delivery station and similarly heating and displacing at said single station other material of the sheet along other localized areas where the front and back panels connect with the spine panel to form the hinge lines of the cover.



3,953,057
PIPE AND TUBE COUPLING

Aristovoulos George Petzetakis, deceased late of Moschaton-Piraeus, Greece, by Irene H. Diapouli; Nicolas G. Petzetakis; Menelaos G. Petzetakis, all of Athens, Greece

Division of Ser. No. 180,299, Sept. 14, 1971, Pat. No. 3,781,041. This application Oct. 9, 1973, Ser. No. 404,744.
The portion of the term of this patent subsequent to Dec. 25, 1990 has been disclaimed
Claims priority, application Greece, Oct. 31, 1970, 44019; Apr. 7, 1971, 45136; 45183; 45285
Int. Cl. F16l *17/02*
U.S. Cl. 285—67 4 Claims



1. A coupling for pipe, tube or hose, comprising a pair of geometrically identical tubular coupling members, each of said coupling members having a circumferentially continuous cylindrical portion and a semicylinder-segmental portion with the semicylinder-segmental portions of the members being in axially overlapping relation and each reaching axially beyond the other semicylindrical-segmental portion, each semicylinder-segmental portion having at its extremity an inwardly extending arcuate shoulder receivable behind an arcuate shoulder formed at the junction between the cylindrical and semicylindrical-segmental portions of the other member, each of said segmental portions being further formed with a radially open groove adjacent its shoulder and form-fittingly receiving the shoulder of the other member at the junction between the cylindrical and semicylindrical-segmental portions thereof; each of said members being formed with a circumferentially continuous outwardly open groove on its cylindrical portion adjacent its segmental portion; a respective circumferentially continuous sealing ring received on said circumferentially continuous grooves; and a retaining sleeve axially shiftable over said member and spanning same for preventing transverse separation of said semicylindrical-segmental portions, said sealing rings sealingly engaging the interior of said sleeve, each of said coupling members having flanks lying in radial planes and abutting the flanks of the shoulder of the other member.

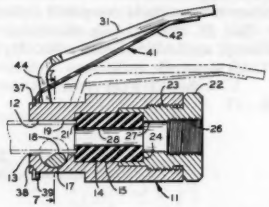
3,953,058
TUBE COUPLING

John W. Soblesky, Clyde, Ohio, assignor to Dale Products, Inc., Fremont, Ohio

Filed Dec. 20, 1974, Ser. No. 534,683
Int. Cl.² F16L *37/20*
U.S. Cl. 285—110 18 Claims

1. A coupling for a smooth walled, right circular, tube portion to restrict longitudinal motion of the tube portion in a first direction comprising a tube receiving portion having a reaction surface to restrict motion of the tube portion it is adapted to receive transverse of the longitudinal axis of said tube portion and having a longitudinal axis parallel to the longitudinal axis of said tube portion; a locking element rotatable around an axis of rotation in a plane intersecting the longitudinal axis of tube receiving portion; means biasing said element for rotation around said axis of rotation in a given direction whereby points on a surface of said element proxi-

mate said tube receiving portion and engageable with a tube portion received therein have a component of bias force in said first direction; means for rotating said element around said axis of rotation in a direction opposite said given direction; and a gripping surface on said locking element adapted to engage an arcuate region of the smooth walled tube portion



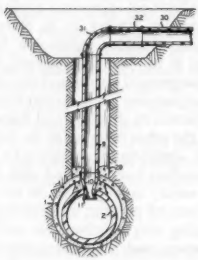
received in said tube receiving portion on the side of the tube portion opposite said reaction surface, said gripping surface defining successive arcs of circles of increasing radius from centers lying equidistant from the longitudinal axis of said tube receiving portion in a plane normal to said longitudinal axis of said tube receiving portion as said locking element is rotated in a direction opposite said given direction.

3,953,059

PIPE CONNECTION AND PROCESS TO MAKE SAME

James C. Carroll, Bartlesville, and Arthur H. McElroy, Tulsa, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 21, 1974, Ser. No. 516,365
Int. Cl.² F16L *41/00, 47/00*
U.S. Cl. 285—192 **15 Claims**



8. A pipe connection comprising

a first pipe having at least one end thereof consisting essentially of a polymer selected from the group consisting of polyethylene and copolymers of ethylene and a small quantity of another mono-1-olefin having from 3 to 8 carbon atoms per molecule, said polymer having a weight average molecular weight of about 200,000 to about 1,000,000 and said one end being cold swageable and having a mechanical memory,

connected to said one end of said pipe a second pipe of larger diameter than the first pipe having a hole formed in the wall of said second pipe through which said cold-swageable end of said first pipe is inserted, the diameter of said hole being smaller than the external diameter of said first pipe,

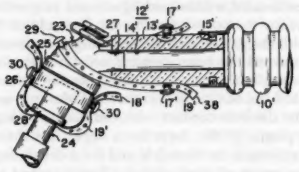
said one end of said first pipe being under a mechanical stress pressing towards the wall of said hole, said stress resulting from a coldswaging step wherein the end of said first pipe was cold-swaged to fit through said hole and from the recovery of said end of said first pipe from the coldswaged shape toward its original shape and into firm contact with the wall of said hole without employing temperature differences.

3,953,060

SLIP-PROOF COUPLING DEVICE

Bela Eross, Penn Hills Township, Allegheny County, Pa., assignor to Instrumentation Industries, Inc., Pittsburgh, Pa.

Filed Sept. 20, 1971, Ser. No. 181,705
Int. Cl.² F16L *27/08, 37/00*
U.S. Cl. 285—272 **1 Claim**



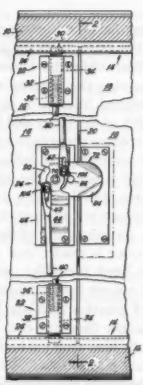
1. A coupling assembly for coupling sections of tubing, comprising a sleeve member to the opposite ends of which sections of tubing may be telescopically joined to form a connection, fastening members on opposite sides of said sleeve member, a swivel fitting provided between one of said sections of tubing and said sleeve member, a first elongated resilient strap the opposite ends of which are provided with a plurality of spaced engaging means removably securable to the fastening members on said sleeve member said resilient strap removably engaged intermediate said ends to one part of said swivel fitting, and a second resilient strap removably secured adjacent its opposite ends to fastening members on another part of said swivel fitting and engaged intermediate its said ends to said one section of tubing.

3,953,061

DOOR FASTENING MEANS

Randall C. Hansen, Lake Forest, and Kenneth J. Miller, Gurnee, both of Ill., assignors to A. L. Hansen Mfg. Co., Gurnee, Ill.

Filed Sept. 23, 1974, Ser. No. 508,432
Int. Cl.² E05C *5/00, 1/06*
U.S. Cl. 292—5 **7 Claims**



1. For use with a door frame having upper and lower elements, a door having a vertical edge hinged to the frame, keeper members secured to the upper and lower elements of the frame, spring biased latch bolts carried by the door and engageable with the keeper members, and toggle bars connected at their one ends to the latch bolts, the combination of a cam disc rotatably carried by the door and having an arcuate cutout in the edge portion thereof defining a pair of end shoulders, connecting means connecting the other ends of the

toggle bars to said cam disc at diametrically opposed locations thereon, a lock actuator plate rotatably carried by the door coaxially of said cam disc, a post member secured to said lock actuator plate and movable within said cam disc cutout, and actuator means operatively connected to said actuator plate to rotate the same between a first unlocked position wherein the latch bolts are disengaged from the keeper members, a second intermediate position wherein said post member on said actuator plate upon rotation of said lock actuator plate engages an end shoulder of said cam disc to rotate the same thereby effecting movement of the toggle bars and the latch bolts into engagement with the keeper members and a third fully locked position wherein said actuator plate projects laterally above the door frame.

3,953,062

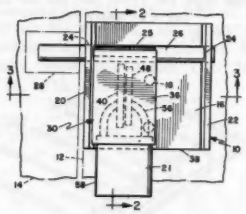
PADLOCK CLASP

John F. Maston, 1045 Naranca, El Cajon, Calif. 92021

Filed June 10, 1975, Ser. No. 585,477

Int. Cl.² E05C *5/02*

U.S. Cl. 292—57 **10 Claims**



1. A clasp for being connected to a door and lockable by a padlock, which clasp comprises:
   - a back plate member for being connected to the door adjacent the door frame,
   - a bolt slidably mounted in said back plate member and movable between door locked and door unlocked positions,
   - said bolt received in an opening in the door frame in the door locked position,
   - a front plate member connected to said bolt and overlying at least a part of the padlock in the door locked position,
   - a first padlock bale support member connected to said back plate member and extending outwardly toward said front plate member and having a hole to receive the bale,
   - a second bale support member connected to said front plate member and extending toward said back plate member and having a hole to receive the bale,
   - and said holes in said first and second bale support members aligned for the mutual reception of the bale when the padlock is locked.

3,953,063

COKE OVEN DOOR CLOSURE

Franz Steimann, Gelsenkirchen-Horst, Germany, assignor to Didier Engineering GmbH, Essen, Germany

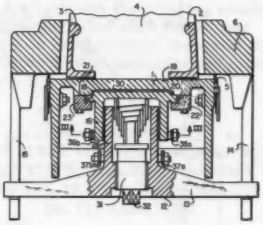
Filed Dec. 9, 1974, Ser. No. 530,842

Claims priority, application Germany, Dec. 29, 1973, 2365191

Int. Cl.² E05C *21/02*

U.S. Cl. 292—144 **12 Claims**

1. In oven doors, particularly coke oven doors, of the type including a door frame, a door body and locking hooks associated with the door frame for cooperation with a door closure device to lock the door body with respect to the door frame; the improvement wherein said door closure device comprises:
   - a spring bearing member on said door body;
   - a locking bar engageable with said locking hooks when said door body is in the locked position;
   - said locking bar having a locking bar support extending toward said spring bearing member;
   - a compression spring positioned between said spring bearing member and said locking bar support and urging said locking bar support and locking bar away from said spring bearing member;



   - a sliding carriage guide on said door body, said spring bearing member being mounted in said sliding carriage guide for longitudinal sliding movement therein along a direction parallel to the plane of said door body; and
   - a lever system mounted on said door body and hingedly connected to said spring bearing member and said locking bar support.

3,953,064

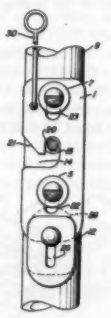
GATE LATCH

Warren B. McHenry, 5316 Crittenden St., Hyattsville, Md. 20781

Filed Mar. 25, 1975, Ser. No. 561,841

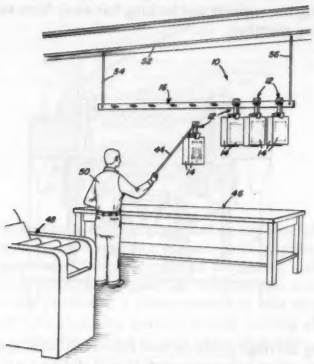
Int. Cl.² E05C *1/06*

U.S. Cl. 292—184 **8 Claims**



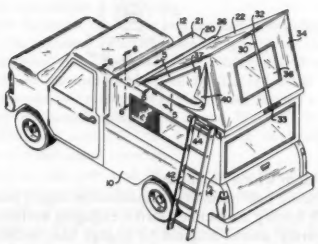
1. A latch which comprises
   - a. a sliding bolt normally maintained in closed position, said bolt having an inclined strike engaging surface;
   - b. a strike means adapted to engage said inclined surface and move said bolt to an open position and permit engagement of said strike means in a locking slot in said bolt;
   - c. a guide means adapted to guide said bolt to open/closed positions, said guide means including a plurality of elongated holes in said bolt and mounting bushing slidably passing therethrough; and
   - d. a bolt blocking means slidably and rotatably fixed to said bolt and being adapted to slide and rotate to selected blocking and non blocking positions.

3,953,065
OFFSET PLATE RACK AND HOLDERS
Edward J. Shannon, Jr., 3104 Jessica, Metoirie, La. 70003
Filed Sept. 25, 1974, Ser. No. 509,350
Int. Cl.² A47F 5/08
U.S. Cl. 294—1 R 5 Claims



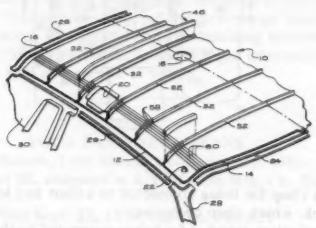
2. An offset plate rack and holder system, comprising, in combination:
- a. a plate holder provided with gripping means for holding an offset plate; and
- b. a rack provided with retaining means for supporting a plate holder, said plate holder including a body member provided with an enlarged head portion forming shoulders arranged for engaging the retaining means of the rack and suspending the body member on the rack, said gripping means including a pair of spring-biased clamps mounted on opposite sides of a portion of the body member spaced from the head portion, and a pointer for manipulating the plate holder, the head portion of said plate holder being provided with an aperture arranged for receiving an end of the manipulating pointer.

3,953,066
CAMPER SHELL
Philip O. Hamilton, 1624 Rouse Ave., Modesto, Calif. 95353
Filed Nov. 25, 1974, Ser. No. 526,657
Int. Cl.² B60P 3/34
U.S. Cl. 296—23 R 6 Claims



1. A camper shell adapted to be mounted on the bed of a pickup truck or similar vehicle, said camper shell comprising:
- a shell structure adapted to be mounted to the bed of the vehicle, said shell structure including side portions extending upwardly from the side-defining portions of said bed to a vertical height approximately equal to the height of the cab of the vehicle, and a roof including a forward portion fixed to the side portions of the shell structure and a movable portion hingeably mounted to the trailing end of the forward portion along an axis normal to the direction of travel of the vehicle so that said movable portion can be raised at its trailing end to add to the interior space of the shell structure when the vehicle is parked and lowered to streamline the shell structure when the vehicle is moving;
- flexible means connecting the sides and trailing edges of the movable portion of the roof to the side portions of the shell structure for enclosing the interior of the shell structure when the movable portion of the roof is raised;
- a ceiling structure spanning the side portions of the shell structure adjacent the upper ends of said side portions;
- a bunk mounted to the upper surface of the ceiling structure beneath the movable portion of the roof;
- means for clamping the movable portion of the roof in the lowered position when the vehicle is moving; and
- means for maintaining the movable portion of the roof in the raised position when the vehicle is parked.

3,953,067
VEHICLE HEADLINER CONSTRUCTION
Richard A. Isola, 6748 Leslee Crest Drive, West Bloomfield, Mich. 48033
Filed Sept. 18, 1974, Ser. No. 507,369
Int. Cl.² B60J 7/10
U.S. Cl. 296—137 A 212 Claims

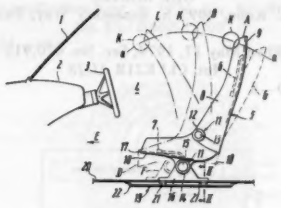


1. A vehicle headliner construction adapted to be mounted adjacent the underside of a vehicle roof and extend laterally between the longitudinal side edges of the roof and longitudinally between the front and rear edges of the roof,
- said headliner comprising a sheet of a relatively rigid but foldable material having at least one reversely folded portion providing a seam appearing line on the side of the headliner confronting the interior of the vehicle.

3,953,068
SAFETY PASSENGER SEAT APPARATUS
Ferdinand Alexander Porsche, Doeffingen, and Werner Scholpp, Stuttgart-Weilimdorf, both of Germany, assignors to Porsche Design, Germany
Filed Feb. 15, 1974, Ser. No. 443,142
Claims priority, application Germany, Feb. 15, 1973, 2307366
Int. Cl.² A47C 1/08
U.S. Cl. 297—216 17 Claims

1. A safety passenger seat apparatus for a vehicle of the type having relatively fixed support structure, said apparatus comprising:
- a passenger seat having a seat rest portion moveable substantially linearly with respect to said support structure and a back rest portion pivotally moveable with respect to said seat rest portion,
- a single energy transformer for absorbing energy connected to said support structure, and
- connecting means operatively connecting said passenger seat to said energy transformer such that pivotal movement of said back rest portion with respect to said seat

rest portion, movement of said seat rest portion with respect to said support structure or both upon collision of



said vehicle causes energy absorption by said energy transformer.

3,953,069

VEHICLE SEAT BACK TILT CONTROL MECHANISM

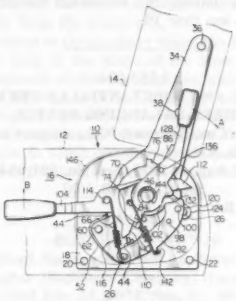
Takeo Tamura, Tokyo, and Hideo Ishida, Kozai, both of Japan, assignors to Nissan Motor Company Limited, Yokohama and Fuji Kiko Company Limited, Tokyo, both of, Japan

Continuation of Ser. No. 409,148, Oct. 24, 1973, abandoned. This application Apr. 15, 1975, Ser. No. 568,202

Claims priority, application Japan, Oct. 25, 1972, 47-107428; Mar. 16, 1973, 48-31112

Int. Cl.² B60N *1/02*

U.S. Cl. 297—367 **15 Claims**



1. A tilt control mechanism for a vehicle seat having a seat cushion and a seat back tiltable about an axis, which comprises;

a first hinge member mounted on the side portion of said seat back;

a second hinge member mounted on the side portion of said seat cushion and hinged on said first hinge member by a rotatable shaft;

lock means locking said first hinge member at a selected angular position relative to said second hinge member when actuated and allowing said first hinge member to rotate when unlocked;

actuating means connected to said lock means and actuating said lock means;

said lock means including a dog plate pivotally mounted on a stub shaft securely fixed on said second hinge member, said dog plate having thereon a toothed portion, a toothed end portion of said first hinge member being engageable with the toothed portion of said dog plate;

memorizing means including

a generally circular memory plate coaxially disposed on said rotatable shaft and having on one peripheral portion thereof an arcuate gain for receiving said cam portion so as to cause said actuating plate to move said dog plate into engagement with said toothed end portion of said first hinge member thereby causing said first hinge member to be locked and having on another peripheral portion thereof a toothed portion, a dog member movably disposed on said first hinge member, said dog member being selectively engageable with the toothed portion of said circular memory plate;

memory change means allowing said memorizing means to change the memorized angular position thereof when actuated;

a release lever being rotatable about said axis and having means connectable with said actuating means, for releasing said actuating means when rotated; and

an actuating lever being rotatable about said axis for rotating said release lever and actuating said memory change means when it is manually rotated.

3,953,070

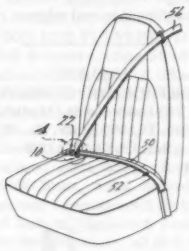
ADJUSTABLE TONGUE FOR SEAT BELT

Robert C. Fisher, 4210 N. Dixie, West Palm Beach, Fla. 33407

Filed Dec. 19, 1974, Ser. No. 534,224

Int. Cl.² A62B *35/00*

U.S. Cl. 297—389 **10 Claims**



1. In a seat belt restraint system comprising a seat belt, means for anchoring one end of said seat belt on the floor of a motor vehicle, means for tensioning the other end of said seat belt, the improvement comprising an adjustable tongue freely slidable relative to said seat belt when said belt is in the fully retracted condition, said tongue comprising a frame having means thereon engageable with a seat belt buckle, a belt bar extending generally parallel to and in spaced relation to said frame, said belt passing between said frame and said belt bar, and means on said belt bar engageable with said frame to preclude movement of said belt bar in a direction generally normal to the direction of tension loads on said belt when said belt is in operative position about the occupant of a vehicle.

3,953,071

BACK MOUNTING STRUCTURE FOR A CHAIR

Kenneth H. Striebel, Peru, Ind., assignor to Kofabco, Inc., Peru, Ind.

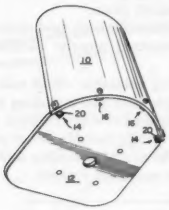
Filed July 11, 1975, Ser. No. 595,051

Int. Cl.² A47C *7/02*

U.S. Cl. 297—454 **4 Claims**

4. A chair comprising a generally horizontal chair seat portion and a chair back portion extending generally vertically upwardly from the chair seat portion along a generally curvilinear rearward edge thereof and attached thereto by a plurality of angle brackets, each said angle bracket having a generally horizontally extending leg and a generally vertically extending leg, some of said angle brackets being more centrally disposed along the adjoining edges of said seat and back and others of said brackets being more outwardly disposed along said adjoining edges, said horizontally extending legs of said more centrally disposed angle brackets being attached to the seat on the top surface thereof and said vertically extending legs thereof projecting downwardly from said horizontally

extending legs between said seat and said back, and said angle brackets more outwardly disposed being attached to the seat on the bottom thereof and said vertically extending legs



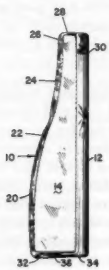
thereof projecting upwardly from said horizontally extending legs between said seat and said back thereby minimizing the tendency of said angle brackets to deform due to forces applied along said curvilinear joined edges.

3,953,072

ORTHOPEDIC CUSHION

Salomon Esquivel, 713 Oakwood St., Montebello, Calif. 90640

Filed Oct. 19, 1973, Ser. No. 408,171
Int. Cl.² A47C 3/00
U.S. Cl. 297—460 2 Claims



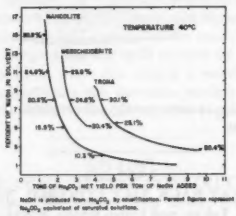
1. An orthopedic cushion, comprising:
an enclosure having:
a front wall of flexible fabric material to permit breathing passage of air therethrough;
a substantially vertical back wall of flexible plastic material;
side walls connecting the side edges of the front and back walls, said side walls being relatively wide at the lower portion and tapering inwardly and upwardly and then curving upwardly to a substantially narrower part;
a top wall closing the upper end of the enclosure;
a substantially flat bottom wall comprising a rearwardly extending lower portion of the front wall and a forwardly extending lower end portion of the back wall, the free transverse edges of said portions being adjacent each other in defining an elongated opening in said bottom wall, said opening extending transversely of the cushion;
a unitary body of medium to firm density foam in the enclosure, the vertical section of said material conforming to the shape of the side walls, comprises a bulging part for supporting a portion of the spine for release of muscular tension, said cushion being transversely concavo-convex;
and means for closing said opening in one of the walls.

3,953,073

PROCESS FOR THE SOLUTION MINING OF SUBTERRANEAN SODIUM BICARBONATE BEARING ORE BODIES

Wolfram H. Kube, 4093 S. Rosemary Way, Denver, Colo. 80237

Filed May 17, 1974, Ser. No. 470,912
Int. Cl.² E21B 43/28
U.S. Cl. 299—5 3 Claims



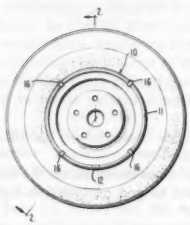
1. In a process for the solution mining of subterranean trona deposits wherein a portion of said deposit is dissolved in an aqueous solution containing a sufficient concentration of sodium hydroxide to prevent the sodium bicarbonate concentration in the brine from reaching a saturated condition when nahcolite alone is in the stable solid phase, the improvement which comprises limiting the maximum sodium hydroxide concentration to less than 3%.

3,953,074

AUTOMATIC AND SUBSTANTIALLY PERMANENT WHEEL BALANCING DEVICE

Woodrow Wilson Cox, Andrews, N.C., assignor to Herman E. Cox, Greenville, S.C.

Filed Aug. 4, 1975, Ser. No. 601,664
Int. Cl.² B60B 1/00
U.S. Cl. 301—5 BA 8 Claims



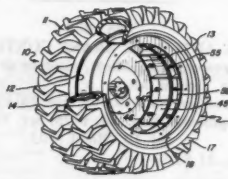
1. A wheel balancing device comprising an annular tube body adapted for attachment to one side of a wheel, a multiplicity of separately formed relatively short tube segments disposed bodily within the interior of said tube body and adapted to circulate freely circumferentially therein and collectively filling a major portion of the volume formed by the interior of the tube body, and a multiplicity of relatively small ball elements disposed within the interior of the tube body and adapted to circulate freely therein and also adapted to circulate freely through the interiors of said tube segments, whereby the tube segments and ball elements may be distributed by centrifugal force during rotation of a wheel to which the device is attached for balancing said wheel.

3,953,075

AUXILIARY WHEEL MOUNTING

Richard S. Bonomo, P.O. Box 453, Delavan, Ill. 61734

Continuation of Ser. No. 299,141, Oct. 19, 1972, abandoned.
This application Sept. 3, 1974, Ser. No. 502,535
Int. Cl.² B60B 11/00
U.S. Cl. 301—40 S 8 Claims



1. An auxiliary wheel and mounting for attachment to the regular wheel of a vehicle, in coaxial side-by-side relation to and for rotation with the regular wheel, the auxiliary wheel being on the outside and the regular wheel being on the inside with respect to the vehicle, the regular wheel having an axle, a wheel carrier supported from the axle, a wheel rim, means joining the wheel rim to the wheel carrier and a tire on the wheel rim, the regular wheel tire having a convex outer sidewall the outer extremity defining a plane spaced outwardly from the wheel rim and from the end of the axle, said auxiliary wheel and mounting comprising:

an auxiliary wheel rim,

an auxiliary tire on the auxiliary wheel rim, having a convex inner sidewall the inner extremity defining a plane spaced inwardly from the wheel rim,

means secured to the auxiliary wheel rim having a mounting surface lying in the plane of the inner extremity of the inner sidewall of the auxiliary tire, and

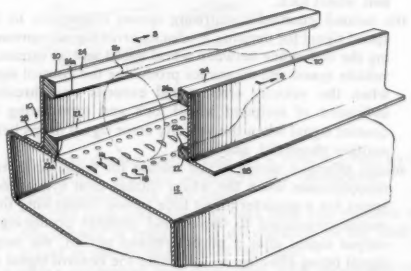
means on the regular wheel having a complementary surface lying substantially in the plane of the outer extremity of the outer sidewall of the regular tire on the regular wheel rim, to which complementary surface the mounting surface of the auxiliary wheel is secured.

3,953,076

BOTTLE CONVEYOR

Stanley E. Hurd, Sunnyvale, Calif., assignor to The Motch & Merryweather Machinery Company, Hayward, Calif.

Filed July 23, 1974, Ser. No. 491,025
Int. Cl.² B65G 51/02
U.S. Cl. 302—2 R 10 Claims



1. An air conveyor for articles such as containers and the like having a generally symetrical continuous exterior wall surface with a predetermined dimension between laterally opposed wall portions of said articles comprising:

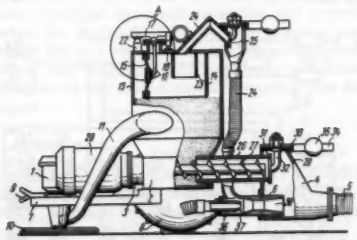
a deck plate with a plurality of openings therein for issuing air jets to move articles along the conveyor, means for supplying pressurized air through the deck plate openings, said openings extending in a row along the conveyor surface, a pair of imperforate upstanding wall members extending longitudinally of the conveyor in confronting relation to each other and being located on opposite sides of the row of openings, said side wall members being spaced apart a distance greater than the predetermined lateral dimension of said articles, each of said side wall members having first guide surfaces being disposed along the upper inner marginal edge thereof to define cooperating guide surfaces spaced apart a distance less than the predetermined lateral dimension of said articles thereby to guide said articles by engaging spaced longitudinally extending portions of each article wall surface, whereby said articles cooperate with the first guide surfaces to trap and conserve conveying air between the articles and the deck surface, and a second pair of spaced guide members extending longitudinally of the conveying surface for supporting the articles above the deck plate surface, said second guide surfaces being generally parallel to each other and being spaced apart a distance less than the predetermined lateral dimension of said articles.

3,953,077

VACUUM-AND-PRESSURE PNEUMATIC CONVEYING INSTALLATION FOR PULVERIZED MATERIALS

Valery Anatolievich Kulyabko, ulitsa 50 let Oktyabrya, 5, kv. 97; Nikolai Andreevich Evstigneeve, ulitsa Chaikovskogo, 2, kv. 50; Fedor Romanovich Petrov, prospekt Lenina, 55, kv. 33, all of Volzhsky; Anatoly Petrovich Pleshivtsev, ulitsa Bakinskaya, 5, kv. 27, Volgograd; Vasily Ivanovich Somov, ulitsa Krasnopitterskaya, 11, kv. 3, Volgograd; Leonid Mikhailovich Cherkasov, ulitsa Karpovskaya, 39, Volgograd; Mikhail Ivanovich Jusov, ulitsa Bobruiskaya, 2, kv. 35, Volgograd; Alexandr Alexandrovich Sivkov, ulitsa Engelsa, 11, kv. 44, and Robert Nikolaevich Lazarev, ulitsa Sverdlova, 8, kv. 8, both of Volzhsky, all of U.S.S.R.

Filed May 14, 1975, Ser. No. 577,417
Int. Cl.² B65G 53/66, 53/28
U.S. Cl. 302—21 7 Claims



1. A vacuum-and-pressure pneumatic conveying installation for pulverized materials comprising: a settling chamber; a suction device communicating with said settling chamber; a material unloading mechanism built into the lower part of said settling chamber; an aerating chamber connected with said settling chamber by said material unloading mechanism which also delivers material into said aerating chamber; a transport pipeline connected to said aerating chamber; a jet blower whose suction space is connected with said settling chamber for building up vacuum therein required for drawing the material into said settling chamber and sucking dusty air from it while its delivery space is connected with said aerating chamber for building up pressure therein required for transporting the material from said aerating chamber; a hollow element which is open at the bottom, is secured to the upper part of the settling chamber and its lower edge is intended to limit the level of material in said settling chamber; at least one diaphragm located in the wall of said hollow element; a valve

built into the upper part of said settling chamber, intended to control the supply of atmospheric air into said settling chamber when the latter becomes filled with material above the lower edge of said hollow element; and a rod connecting said diaphragm with said valve.

3,953,078

SYSTEM OF PNEUMATIC TRANSPORT OF DOMESTIC REFUSE AND THE LIKE

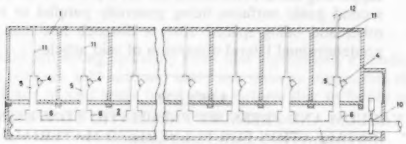
Ian Miller Edington Aitken, London, England, assignor to AB Centralsug, Solna, Sweden

Filed Aug. 15, 1973, Ser. No. 387,513

Claims priority, application Sweden, Aug. 15, 1972, 10587/72

Int. Cl.² B65G *53/06*

U.S. Cl. 302—27 **4 Claims**



3. A system in accordance with claim 2 wherein the respective junctures of the collecting conduit and several chutes are widened to provide enlarged transition chambers.

3,953,079

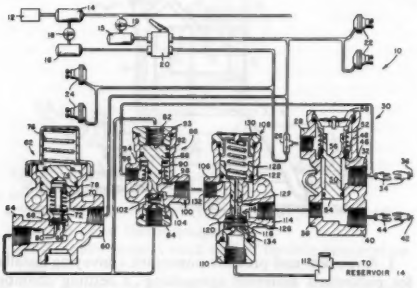
FLUID PRESSURE BRAKING SYSTEM INCLUDING A PRESSURE DIFFERENTIAL RESPONSIVE VALVE DEVICE

Milan J. Sebo, and Roy E. Bartholomew, both of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed Mar. 6, 1975, Ser. No. 556,042

Int. Cl.² B60T *13/00*

U.S. Cl. 303—7 **5 Claims**



1. In a fluid pressure braking system for a vehicle having service brakes, a service braking system including a first portion for actuating some of said service brakes and a second portion communicated to said first portion for actuating the rest of said service brakes, operator-actuated valve means for controlling fluid pressure communication in said service braking system, regulating valve means having an inlet connected to said brake valve and an outlet, valve members located between said inlet and outlet for preventing communication therebetween until a predetermined pressure level is attained at said inlet and thereafter communicating said inlet and outlet, and valve means having a first inlet connected to the outlet of said regulating valve means, a second inlet connected to the connection between said first and second portions of the service brake actuating systems, pressure differential responsive valve members shiftable to an actuating position when the pressure level at said first and second inlets are in a predetermined relationship with one another, and means responsive to shifting of said pressure differential responsive means to said actuated position for closing communication between the first and second portions of said service actuating system.

3,953,080

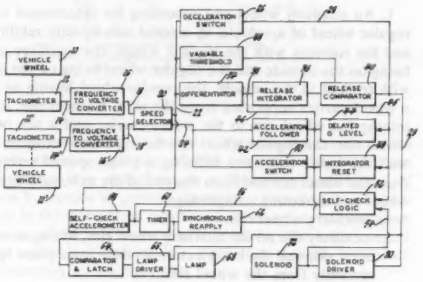
ADAPTIVE ANTI-LOCK BRAKE CONTROL SYSTEM

Richard J. Bremer, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 419,693, Nov. 28, 1973, abandoned. This application Mar. 24, 1975, Ser. No. 561,159

Int. Cl.² B60T *8/02*

U.S. Cl. 303—21 BE **4 Claims**



1. A control apparatus for an anti-lock brake system for a vehicle with braked wheels comprising

means providing a speed signal which represents wheel speed,

a control circuit for producing an on/off control signal,

release means activated by the control signal to effect brake release when the control signal is initiated and brake reapplication when the control signal is terminated,

the control circuit including first and second channels each for independently sensing incipient wheel lock and producing the control signal,

the first channel comprising a deceleration sensing means responsive to the speed signal for producing the control signal when the rate of change of wheel speed exceeds a predetermined deceleration threshold indicative of incipient wheel lock,

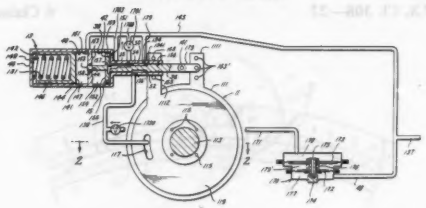
the second channel comprising means responsive to the speed signal for deriving a velocity error signal representing the difference between wheel speed and an estimated vehicle speed and means for producing the control signal when the velocity error signal exceeds one threshold indicative of incipient wheel lock and terminating the control signal when the velocity error signal drops below another threshold, and

means effective during brake release for requesting brake reapplication when the wheel rotates near synchronous speed for a predetermined time period comprising timer means connected to the second channel producing an output signal after a predetermined period, the output signal being effective to terminate the control signal and to request brake reapplication, and timer reset means for resetting the timer including accelerometer means responsive to the speed signal for supplying a reset signal to the timer means when the wheel acceleration exceeds preset limits and means responsive to the release means for supplying a reset signal to the timer means when the brakes are applied.

3,953,081
ANTILOCKING BRAKING SYSTEM

William Roy King, 1909 Sunshine Square, Longview, Tex. 75601

Filed Nov. 11, 1974, Ser. No. 522,477
Int. Cl.² B60T 8/093
U.S. Cl. 303—21 CH 25 Claims



1. In a fluid braking system including an individual wheel braking system and source of pressurized braking fluid connected thereto, the improvement which comprises:

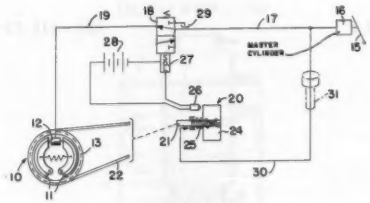
means for blocking fluid flow between the individual wheel braking system and the source of pressurized braking fluid, in response to excessive slipping of the individual wheel, and

means for continuous varying of the pressure in the individual wheel braking system while such fluid flow is blocked.

3,953,082
ANTISKID CONTROL SYSTEM

Donald L. Smith, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 25, 1974, Ser. No. 445,065
Int. Cl.² B60T 8/04
U.S. Cl. 303—21 A 8 Claims



1. A wheel deceleration sensor for a vehicle wheel having a variable force, operator actuated brake, comprising:

a shaft rotatable with said wheel;

an inertial mass rotatable with said shaft and movable axially thereof in response to deceleration of the shaft in excess of the deceleration of the mass;

a spring restraining said mass from axial movement with respect to said shaft;

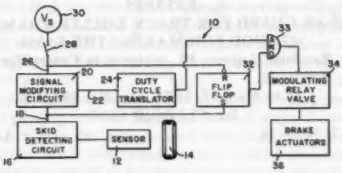
means responsive to the force with which the operator actuates the brake to vary the restraint on axial movement of the mass directly as a function of the braking force applied by the operator; and

means responsive to axial movement of the mass to indicate excessive wheel deceleration.

3,953,083
DUTY CYCLE TRANSLATOR FOR ADAPTIVE BRAKING CONTROL CIRCUIT

Bruce E. Latvala, and Marc A. Karon, both of Elyria, Ohio, assignors to The Bendix Corporation, South Bend, Ind.

Filed Dec. 9, 1974, Ser. No. 530,784
Int. Cl.² B60T 8/00
U.S. Cl. 303—21 P 16 Claims



1. In a vehicle having a wheel, a brake controlling said wheel, and fluid pressure reponsive means for actuating said brake, and adaptive braking system controlling communication to said fluid pressure responsive means comprising:

speed sensing means for generating a speed signal proportional to the rotational velocity of said vehicle wheel;

skid detecting means responsive to said speed signal for generating a skid detecting signal when an incipient skidding condition of said wheel is detected and terminating said skid detecting signal when the incipient skidding condition terminates;

means responsive to the output of said skid detecting means for generating a brake pressure control signal; and

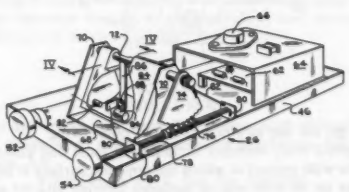
modulator means responsive to said brake pressure control signal for controlling communication to said fluid pressure responsive means;

said brake pressure control signal generating means including means responsive to said skid detecting signal for generating a pressure command signal, means for generating a feedback signal without direct measurement of the fluid pressure level in said fluid pressure actuator, and means for comparing the feedback signal with the pressure command signal and generating said control signal when the feedback signal and the pressure command signal are in a predetermined relationship with one another, said feedback signal generating means being responsive to said control signal to generate said feedback signal.

3,953,084
TOWED VEHICLE ELECTRIC BRAKE CONTROL

Rene E. Pittet, Jr., Marshall, and Philip J. Grant, Homer, both of Mich., assignors to Tekonsha Engineering Co., Tekonsha, Mich.

Division of Ser. No. 385,102, Aug. 2, 1973, Pat. No. 3,909,075.
This application June 30, 1975, Ser. No. 591,435
Int. Cl.² B60T 8/16
U.S. Cl. 303—24 R 3 Claims



1. An inertial sensor for braking control apparatus as in towed vehicles comprising a shaft, a housing adjustably supporting said shaft on an axis transverse to the direction of movement of said towed vehicle, a laminated thin cantilevered

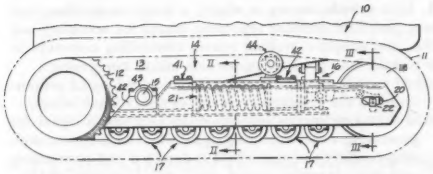
spring member affixed at its upper end to said shaft and being weighted at its lower end and said spring member carrying a light interrupting shield, a light source provided on one side of said housing, and a light sensing target on the other side of said housing, said source and said target being on a common axis interrupted by selected movement of said spring member.

3,953,085

TUBULAR GUARD FOR TRACK ROLLER FRAMES AND METHOD FOR MAKING THE SAME

Victor Randour, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 17, 1975, Ser. No. 558,978
Int. Cl.² B62D 55/10
U.S. Cl. 305—16 14 Claims



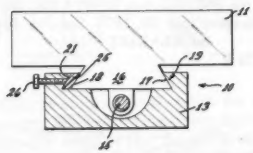
1. In a track-type vehicle of the type comprising a pair of metallic track roller frames mounted on either side thereof and a plurality of track rollers rotatably mounted on each of said frames, the improvement wherein each of said frames comprises a tubular guard including a pair of longitudinally disposed substantially identical members secured together at pairs of upper and lower edges thereof disposed medianly of said guard and extending substantially the full length thereof.

3,953,086

GIB

Frank R. Chaffin, Thousand Oaks, Calif., assignor to W. S. Shamban & Co., Los Angeles, Calif.

Filed July 15, 1974, Ser. No. 488,516
Int. Cl.² F16C 17/00
U.S. Cl. 308—3 A 20 Claims



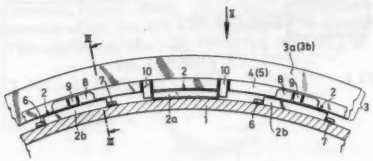
1. A gib for use in a machine tool comprising
a tapered body member including at least one planar surface with respect to which the opposite surface is tapered,
means on at least one of surfaces forming spaced surface portions projecting from said one surface and adapted to form spaced contact areas, and
at least said surface portions being of a material including a thermoplastic polymer having dispersed uniformly therein finely divided particles of a fluorocarbon resin.

3,953,087

BEARING RING MOUNTING FOR ROTARY DRUM

Jürgen Wurr, Ennigerloh; Kurt Henning, and Horst Bönisch, both of Neubeckum, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed May 14, 1975, Ser. No. 577,183
Claims priority, application Germany, May 27, 1974, 7418334[U]
Int. Cl.² F16C 29/00
U.S. Cl. 308—22 6 Claims



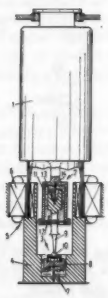
1. In a rotary drum having a bearing ring loosely mounted upon the drum periphery for circumferential movement relative to the drum; the improvement comprising a plurality of axially extending support plates mounted on said drum in underlying relationship to said bearing ring, and a pair of limiting rings mounted on said support plates at the axially opposite sides of said bearing ring to restrict axial movement of said bearing ring relative to said drum while accommodating circumferential movement of said bearing ring relative to said drum.

3,953,088

DEVICE COMPRISING AN AUTOMATICALLY ALIGNING BODY OF REVOLUTION

Arnoldus Paulus Cornelius Maria van der Beek, Beekbergen, Netherlands, assignor to Ultra Centrifuge Nederland N.V., The Hague, Netherlands

Filed Oct. 18, 1974, Ser. No. 516,084
Claims priority, application Netherlands, Oct. 26, 1973, 7314750
Int. Cl.² F16C 23/00
U.S. Cl. 308—147 21 Claims

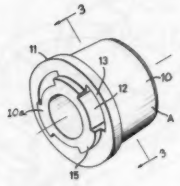


1. A device comprising a body of revolution supported by a pivot means in a damped pivot bearing, a housing rigidly connected with the body of revolution and disposed between said pivot means and said body of revolution, an adjusting body extending into said housing and connected at one end portion thereof to the pivot means, and elastic means for elastically connecting the adjusting body to the housing, said housing containing a highly viscous damping fluid.

3,953,089
PRESS FIT BEARING

Susumu Dainin, Higashiosaka, Japan, assignor to Maruzen Sewing Machine Co., Ltd., Moriguchi, Japan

Filed Dec. 11, 1974, Ser. No. 531,552
Claims priority, application Japan, Dec. 18, 1973, 48-146015
Int. Cl.² F16C 17/02, 27/02, 33/10, 33/66
U.S. Cl. 308—237 R 4 Claims

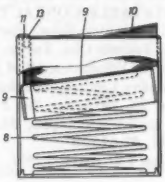


1. A shaft bearing comprising a cylindrical body adapted to be received in a bearing mounting, said body having an axial bore to receive a shaft and having a plurality of equi-angularly spaced passages extending longitudinally through said bore with solid body portions being disposed intermediate adjacent and between passages and each passage being diametrically opposite a substantially equi-angular solid body portion, each of said passages being disposed radially outwardly of said bore and intermediate said bore and the periphery of said body, each passage being arcuate in transverse cross section and located on a common annulus concentric with said bore, the thickness of a body portion disposed outwardly of a passage being less than the thickness of a body portion disposed inwardly of said passage, said outwardly disposed body portions being deformable radially inwardly in response to compressive forces acting on said cylindrical body when received in a bearing mounting.

3,953,090
MEMORANDUM SHEET DISPENSER

Hans Fuchs, Deweerthstrasse 98, 56 Wuppertal 1, Germany

Filed May 27, 1975, Ser. No. 580,740
Claims priority, application Germany, June 5, 1974, 2427203
Int. Cl.² B42F 17/00
U.S. Cl. 312—183 5 Claims



1. A rectangular memorandum sheet dispenser adapted to house individual and separate rectangular memorandum sheets stacked in the dispenser, in which at least the upper part of the inserted stack of memorandum sheets can be opened up in the manner of a stitched memorandum book, so that many memorandum sheets are still held in the memorandum sheet dispenser and the sheets can be written upon, comprising:

an open top, rectangular box-shaped housing having a bottom, a front wall, two sides, and a rear wall;

a triangular shaped closing means at the rear and side walls spanning each rear corner to retain a stack of memorandum sheets at the rear corners and at the top of said stack to expose the major part of the sheet of the stack at the top;

a helical spring fitted under the stack to press said stack upwardly against said closing means at the top of said housing;

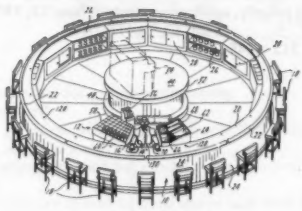
elongated guiding elements directly below and integral with said closing means and adjacent said side walls of said housing, said guiding elements extending downwardly in said housing a short distance to align the sheets in the stack which are recessed in a shape corresponding to the cross section of said guiding elements, whereby the upward movement of said stack follows the recess by the engagement of said guiding elements near the top of the stack; and,

said memorandum sheets of said stack each being provided with guiding recesses adjacent the rear edge thereof and at each side for engagement with said guiding means whereby one is able to pull out any desired memorandum sheet lying deeper in the stack without loosening or undoing any of the sheets lying above it.

3,953,091
MECHANIZED SERVICE BAR

George D. Shults, 1510-79th Ave. North, St. Petersburg, Fla. 33702

Filed Sept. 30, 1974, Ser. No. 510,763
Int. Cl.² A47B 77/08
U.S. Cl. 312—223 19 Claims



1. A mechanized service bar comprising a service counter adapted to accommodate a plurality of patrons at spaced serving stations along one side thereof, a carriage mounted for guided movement along a path immediately adjacent to other side of said service counter, an operating station on said carriage disposed at a position adjacent to said serving stations and adapted to accommodate a carriage operator, reversible drive means operably associated with said carriage propelling said carriage along said path including means controlling the acceleration and deceleration of said carriage from and to a stationary position, actuating means on said carriage disposed at said operating station selectively actuatable by a carriage operator for controlling said reversible drive means and the direction and speed of travel of said carriage, and storage means on said carriage accessible from said operating station for storing a supply of dispensable items for dispensing by the carriage operator directly to the patrons at said serving stations along said service counter.

3,953,092
MINI-DESK

William J. Cronan, and Jerry N. Appling, both of Northport, Ala., assignors to Artistic Innovation Developers, Inc., Tuscaloosa, Ala.

Filed Feb. 3, 1975, Ser. No. 546,459
Int. Cl.² A47B 27/04
U.S. Cl. 312—233 3 Claims

1. A portable desk comprising

a. A relatively rigid and essentially rectangular receptacle, having a depth relatively shallow when compared with

length and width, having means connected thereto for carrying;

b. A writing surface which also serves as a cover for the receptacle, having means for being selectively retained on said receptacle, wherein said selective retaining means comprises flanged tongues on opposite parallel receptacle sides, and flanged means having grooves on matching opposite parallel writing surface sides, allowing lateral movement; said movement restricted by projections on the underside of the writing surface laterally across the diaphragm and side walls of the receptacle, said writing surface being sufficiently resilient to allow the projections to clear the side walls of the receptacle upon application of pressure upwardly on the writing surface, allowing clearance of said projections over said walls;

c. Means attached to the writing surface for selectively retaining writing medium;

d. A plurality of compartments in sizes for separately containing standard writing media and files therefor, writing instruments and paraphernalia; diaphragms for said compartments also creating support for the writing surfaces in wider models of the invention.

3,953,093

KITCHEN UNITS CONSISTING OF PREFABRICATED ELEMENTS

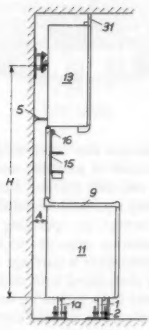
Franz Hero, Stafa, Switzerland, assignor to Team Form AG, Stafa, Switzerland

Filed Nov. 12, 1974, Ser. No. 523,177

Claims priority, application Austria, Nov. 12, 1973, 9488/73

Int. Cl.² A47F *5/08*

U.S. Cl. 312—245 **7 Claims**



1. Kitchen units including prefabricated elements resting only on the floor, such as stoves, floor cabinets, etc., elements (13) secured to a wall, such as overhead cabinets, and elements (19) resting on the floor and secured to a wall, such as tall cabinets, characterized in that the elements (11) are installed on a horizontally aligned supporting bar (1) and a profile bar (1a) in such a way that their rear side is disposed at a distance (A) from the wall, in that the elements (13) which are secured to the wall are suspended at the same distance (A) from the wall on a profile bar (3) which is anchored on the wall and arranged at a predetermined distance (H) from the supporting bar (1), and the elements (19) which both rest on the floor and are secured to the wall are secured to the supporting bar (1) and suspended on the bar (3), the profile bar (3) having a generally L-shaped cross-section, two oppositely directed grooves (3a, 3b) and a vertical flange (3d) on a horizontal arm (3c), a holder (20) which is connected to the elements (13, 19) engaging in said vertical flange.

3,953,094

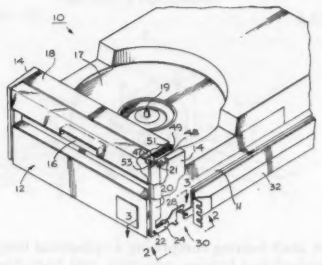
CABINET CONFIGURATION FOR LOADING DISC DRIVE APPARATUS

Leon Henry Brown, Jr., Sylmar, Calif., assignor to Wangco Incorporated, Los Angeles, Calif.

Filed Nov. 30, 1973, Ser. No. 420,663

Int. Cl.² A47B *88/00, 96/00;* **E05B** *3/00;* **E05C** *3/16*

U.S. Cl. 312—303 **8 Claims**



1. In disc drive apparatus adapted for receiving a standard disc cartridge of the top loading type, the combination comprising:

a chassis portion of said apparatus having a disc cartridge space partially extending forward beyond the limit of an associated enclosure;

a front enclosure disposed to enclose said extended chassis portion, said front enclosure comprising a pivotable front panel member, a lid member coupled to the front panel member, the lid member extending in a horizontal plane over a portion of the space in which the disc cartridge may be mounted;

means mounting the front panel member to said chassis for pivoting about an axis along its lower forward edge to permit the front panel and lid members to pivot forwardly about said axis so as to clear the disc cartridge space; and

means for substantially preventing said lid member from moving above said horizontal plane as said front panel is pivoted forwardly,

means for releasably latching the front enclosure and the chassis in the closed position.

3,953,095

ELECTRIC CONNECTION DEVICE HAVING ROTATABLE CONTACTS

Hiroyasu Iino, Ohmiya; Akira Seko; Harutoshi Tsujimura, both of Yokohama; Takashi Oka, Tokyo; Naoki Ogawa, and Hiroshi Tsuda, both of Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Yokohama, Japan

Filed May 20, 1975, Ser. No. 579,216

Claims priority, application Japan, May 27, 1974, 49-59809; May 28, 1974, 49-61520

Int. Cl.² H01R *39/00*

U.S. Cl. 339—6 R **8 Claims**

1. A device for providing electric connection between an element attached to a rotatable member and another element attached to a stationary member, comprising:

a cylindrical housing of an insulating material with vacant cylindrical center;

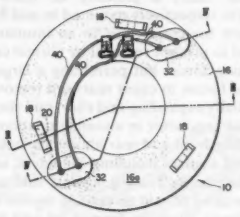
an annular base plate of an insulating material coaxially disposed in said housing in such an arrangement that said base plate is movable within said housing both in circumferential directions and in longitudinal axial directions;

first and second annular contact plates spaced from each other and placed fixedly and coaxially on a first face of said base plate;

first and second contact pins disposed in said housing in such an arrangement that said first and second contact pins are in contact with said first and second contact

plates, respectively, and extend therefrom substantially perpendicularly to said contact plates; and

means for urging said contact pins to be always pushed against said contact plates, respectively, even when said base plate moves within said housing;



said housing being locally shaped and said base plate having at least one vertical arm extending outwardly of said housing such that one of said housing and said base plate can be fixed to said rotatable member and the other can be engaged with said stationary member such that the latter one is restrained from rotating together with said former one.

3,953,096

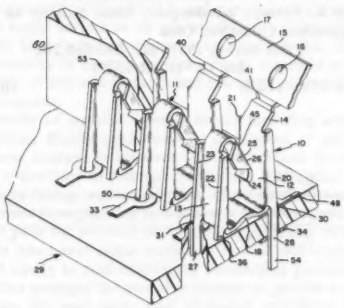
FREE STANDING MOTHER-DAUGHTER PRINTED CIRCUIT BOARD CONTACT ARRANGEMENT

Benjamin Charles Williams, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 429,452, Dec. 28, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,344

Int. Cl.² H05K *1/07*

U.S. Cl. 339—17 L **3 Claims**



1. A free standing contact for mounting in a first board, and which, when used with similar contacts arranged along a line, forms an elongated slot-like arrangement for receiving the edge of a second board for making a series of electrical connections therewith, and comprising:

a U-shaped portion having a first and second leg portions with surfacing each other, and a transverse portion joining together one end of said first and second leg portions;

the free end of said first leg portion being bent over and downwardly into the U configuration and at an angle towards said second leg portion;

the free end of said second leg portion being bent outwardly from said first leg to provide a flared opening for said second board;

at least one section of at least one edge of each of said first and second leg portions being bent back in a direction away from the facing surface of the opposite leg portion to form the cross-sectional areas of said first and second leg portions to include generally L-shaped configurations;

a first pair of said bent-back edges diagonally positioned with respect to each other on said first and second legs, extending continuously beyond the said transverse portion to form post-like terminals for insertion into mating holes in said first board;

a second pair of said bent-back edges diagonally positioned with respect to each other on said first and second legs, terminating upon said first board;

at least one edge of the bent over free end of said first leg portion being bent back and away from the facing surface of said opposite leg.

3,953,097

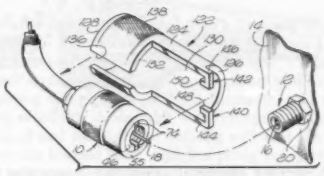
CONNECTOR AND TOOL THEREFOR

Gerald Graham, Kleinburg, Canada, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,343

Int. Cl.² H01R *13/54*

U.S. Cl. 339—37 **1 Claim**



1. A connector for a fitting comprising:

a hollow shell;

a body rotatable inside said shell, said body having a forward end and a rear end;

means preventing said body from being removed from said shell;

means adjacent to said forward end of said body for releasably coupling said body to said fitting upon rotation of said body in one direction;

a pair of spaced recesses opening at said forward end of said body adapted to receive a tool therein for rotating said body;

one-way driving means in said shell engaging said body effecting rotation of said body in said one direction upon rotation of said shell in the same direction, said one-way driving means effecting no rotation of said body upon rotation of said shell in the opposite direction whereby said body cannot be uncoupled from said fitting by rotation of said shell;

said one-way driving means comprising a one-piece spring metal washer;

said body having a pair of flat outwardly facing surfaces thereon in front of and adjacent to said washer, said surfaces being parallel to each other and tangential to an imaginary circle coaxial with the axis of rotation of said body;

said shell having a pair of flat outwardly facing surfaces thereon behind and adjacent to said washer, said surfaces being parallel to each other and coplanar with the corresponding surfaces on said body in one rotative position of said body relative to said shell;

said washer having a pair of integral forwardly extending one-way resilient driving tangs one generally diametrically opposed to the other, said one tang engaging one of said surfaces on said body and said other tang engaging the other of said surfaces on said body upon rotation of said shell in said one direction;

said washer having a pair of integral rearwardly extending one-way resilient driving tangs one generally diametrically opposed to the other, said one tang engaging one of

said surfaces on said shell and said other tang engaging the other of said surfaces on said shell upon rotation of said shell in said one direction;

said surfaces on said body and said shell overriding said resilient tangs upon rotation of said shell in said opposite direction; and

said tangs being bent from said washer along imaginary parallel lines tangential to a second imaginary circle coaxial with said axis.

3,953,098

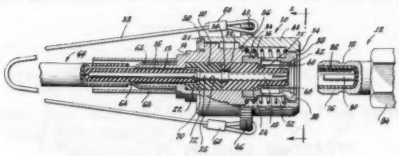
LOCKING ELECTRICAL CONNECTOR

Roger Peter Avery, Bethel, and William Max Erich Zerlin, Newtown, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 257,639, May 30, 1972, abandoned. This application Feb. 1, 1974, Ser. No. 429,798

Int. Cl. H01r *13/54*

U.S. Cl. 339—45 R **1 Claim**



1. A locking electrical connector comprising a tubular electrically conductive body, a block of insulating material carried therein, at least one contact member carried in said block, a tubular outer contact member press fitted in one end of said body and abutting against said block to retain it in said body, fingers on the forward portion of said contact member, the extremities of said fingers being outwardly flexible to expand the diameter of the contact, an inwardly directed projection adjacent the outer end of each finger, adapted to coact with complementarily shaped surfaces on a mating connector, and a longitudinally movable sleeve mounted on said body, said sleeve being movable to a position where it surrounds the outer ends of said fingers, the inner diameter of said sleeve being sized to prevent expansion of the diameter of said contact when said sleeve is in said surrounding position.

3,953,099

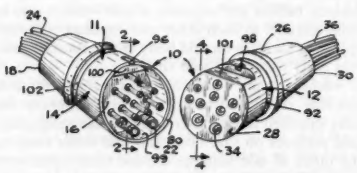
ONE-PIECE ENVIRONMENTAL REMOVABLE CONTACT CONNECTOR

William Dean Wilson, Naperville, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 423,035, Dec. 10, 1973, abandoned, which is a continuation of Ser. No. 275,751, July 27, 1972, abandoned. This application June 2, 1975, Ser. No. 583,233

Int. Cl.² H01R *13/52, 13/64*

U.S. Cl. 339—60 M **8 Claims**



1. A connector assembly comprising mating receptacle and plug members, each comprising

a one-piece molded housing of insulating material with front and rear faces,

a plurality of cavities longitudinally extending between said faces, each of said cavities including a bore in close juxtaposition with said front face and rearwardly contiguous therewith a restricted passage formed by at least one resilient riser, a plurality of rearwardly removable contacts respectively mounted in said bores, each of said contacts for connection to an insulated conductor and shaped to prevent removal by normal contact mating and unmating forces but permitting a larger force than said normal forces to cause rearward removal of said contact by radially expanding said riser, said riser normally retaining said conductor in a sealing relationship, said housing including front and rear abutment shoulders in said bore and said contact including shoulders, said housing shoulders releasably bearing against said contact shoulders, said housing of said receptacle member including a resilient sleeve integrally formed on said housing and frontwardly extending from said front face of said receptacle member, said sleeve including a forward end with an inwardly directed, elastically expandable lip extending circumferentially around said sleeve, and a polarizing shape inside said sleeve and rearwardly disposed from said lip, and said housing of said plug member including a forward end portion including said front face of said plug member and with a cylindrically-shaped outer perimeter for telescoping engagement within said sleeve, said perimeter including a circumferential sealing surface rearwardly spaced from said front face of said plug member for engagement with said sleeve when said receptacle and plug members are mated and a corresponding cutaway portion frontwardly disposed from said sealing surface to receive said polarizing shape.

3,953,100

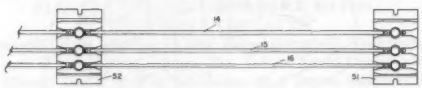
INFRARED LAMP HOLDER

Edward K. Feeney, Worthington, Ohio, assignor to Liebert Corporation, Columbus, Ohio

Filed Apr. 4, 1975, Ser. No. 565,202

Int. Cl.² H01R *13/00*

U.S. Cl. 339—112 R **10 Claims**



1. A lamp holder for an infrared heating unit wherein the lamp is of the type having a base at either end and an energization wire protruding from the base, comprising:

a structure having a plurality of cavities in alternate pairs on both sides of its lower end, the number of cavities equal to the number of lamps held thereby;

said cavities adapted for receiving the bases of said lamps,

a bore extending upwardly from each of said cavities to the uppermost region of said structure,

a conductive bar for each pair of said alternate cavities positioned on the uppermost region of said structure,

said conductive bars having bores therein aligned with said bores in said cavities, said bores in said cavities and said conductive bars adapted to receive said lamp wires, and

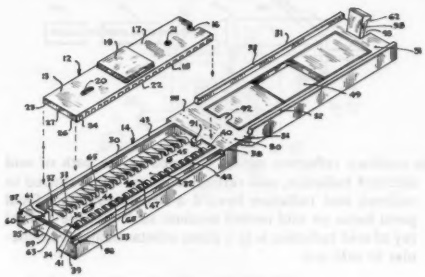
said conductive bars having means for receiving and retaining an energization wire.

3,953,101

ELECTRICAL CONNECTOR ASSEMBLIES

Vincent James Palecek, Cicero, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 196,022, Nov. 5, 1971, abandoned.
This application May 12, 1975, Ser. No. 576,510
Int. Cl.² H01R 13/50, 13/64
U.S. Cl. 339—174 11 Claims



1. An electrical connector for receiving a flat integrated circuit package having a thin, fragile body with a rearwardly directed major surface and a plurality of thin conductive pads arranged longitudinally along opposite sides of said major surface, said connector comprising insulating base means including a cavity with a front face for receiving in juxtaposition said major surface in an electrically connecting position, the front face including opposite longitudinal side surfaces and a plurality of contact-receiving bores arranged in a row along each of said side surfaces and extending rearwardly into the base means,

a plurality of metallic contact means including mounting portions fixedly positioned in said bores of said base means, rearwardly disposed terminal portions for electrical connection to external conductors, free-ended, frontwardly-facing active portions disposed frontwardly a distance from said side surfaces over said bores and below said pads for pressure-developing engagement with said pads when said major surface is moved rearwardly into said cavity to said electrically connecting position, and further arranged for lateral movement to provide a wiping action on said pads, and elongated cantilever spring means extending along portions of said side surfaces and interconnecting said mounting and active portions for developing said pressure,

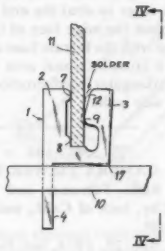
biasing means including means on said contact means and base means for resiliently restraining said active portions frontwardly from free, forward positioning with respect to said front face, restraining means on said base means and cooperating with said body for restraining said major surface and pads against lateral displacement during said lateral movement of said active portions against said pads, polarizing means disposed on the base means and arranged for receiving the package in a predetermined orientation, and holding means fastenable to the base means and engageable with said body for holding said pads rearwardly in pressure engagement against said active portions after rearward movement of said package into said cavity and into said electrically connecting position.

3,953,102

TERMINAL CLIP FOR MICROMODULE

Gianfranco Rivetta, and Guido Castracani, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy

Filed Sept. 16, 1974, Ser. No. 506,111
Claims priority, application Italy, Sept. 18, 1973, 29041
Int. Cl.² H01R 13/12
U.S. Cl. 339—258 R 5 Claims



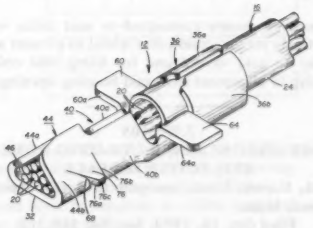
1. A terminal clip to be soldered onto a flat body of dielectric material with a conductive coating on at least one surface, comprising a sheet-metal member forming a base, a first prong and a second prong integral with one another, said base and said first prong being relatively nondeformable, said second prong being resiliently deformable with reference to said base in the plane of said member and defining with said first prong an insertion slot for said body, said first prong being provided with a first projection at its free end and with a second projection at said base, said first and second projections facing said second prong to bear upon a surface of the inserted body, said second prong being provided with a third projection facing said first prong between said first and second projections to bear upon another surface of the inserted body, said first and second projections being tangent to an imaginary line spaced from said third projection, said base having an edge transverse to said imaginary line forming a seat for said body between said second projection and said second prong, said member further having a connecting tab extending outwardly from the region of said first prong.

3,953,103

PLUG-IN TERMINAL

Joseph D. Mathis, Indianapolis, Ind., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 27, 1974, Ser. No. 544,528
Int. Cl.² H01R 11/08
U.S. Cl. 339—276 T 8 Claims



1. An electrical connector, which comprises:

an elongated ferrule base constructed of electrically conductive, ductile material;

a pair of first side walls projecting in the same direction from opposite sides of said ferrule base along the length thereof, said first side walls being of different heights and

being of sufficient heights to be deformed toward each other to abut the end of the shorter side wall against the edge face of the longer side wall to define with the ferrule base a triangular configuration, and

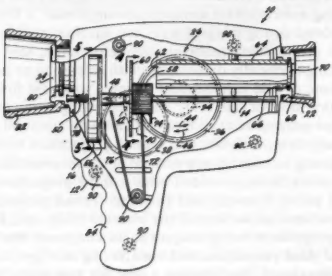
a pair of second side walls projecting in said same direction from opposite sides of said ferrule base along the length thereof, said second side walls being of different heights and projecting further from said base than said first side walls, and being of sufficient heights to be deformed toward each other to abut the end of the shorter second side wall against the edge face of the longer second side wall to define with the ferrule base a triangular configuration having a cross-sectional area which is greater than that of the triangular configuration defined by the deformed first side walls.

3,953,104

CAMERA VIEWER TOY

Nicholas Joseph Roitz, Torrance, and Harold Eugene Steinberg, Culver City, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 25, 1974, Ser. No. 526,993
Int. Cl.² G02B 27/08
U.S. Cl. 350—4 **8 Claims**



1. A camera viewer toy, comprising:

a housing having the general size and shape of a camera;

a color wheel rotatably mounted in said housing, said color wheel having an opening provided therein and a plurality of colorful designs surrounding said opening;

an eye piece mounted in said housing upstream of said color wheel and in alignment therewith;

An opening in said housing downstream of said color wheel, said housing opening being in alignment with the opening in said color wheel when said color wheel is held in a predetermined, rotated position, whereby a viewer using said eye piece may view objects outside of said housing; and

wheel-moving means connected to said color wheel for selectively rotating said color wheel to present a colorful display to said viewer and for fixing said color-wheel opening in alignment with said housing opening.

3,953,105

HOLOGRAPHIC SCANNER UTILIZING AUXILIARY REFLECTIVE SURFACE

Charles Ih, Darien, Conn., assignor to Epsco, Incorporated, Westwood, Mass.

Filed Oct. 16, 1974, Ser. No. 515,317
Int. Cl.² G02B 27/17; G03H 1/04
U.S. Cl. 350—7 **4 Claims**

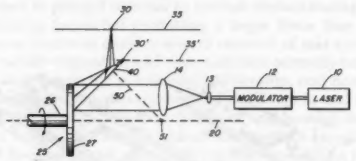
1. An optical scanning system, comprising:

an optical spinner having a surface rotatable about an axis that is substantially perpendicular to said surface at its point of intersection with said axis; a record medium curved about an axis parallel to said axis;

means for effecting rotation of said surface about said axis;

means for directing a source of coherent radiation toward said surface;

a zone-plate lens covering at least a portion of said surface, said lens being configured to receive said radiation and direct it at a skewed angle with respect to both said surface and said axis toward a first scanning focal point locus; and



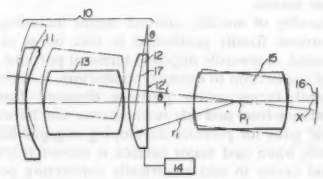
an auxiliary reflective means disposed in the path of said directed radiation, said reflective means being shaped to redirect said radiation toward a second scanning focal point locus on said record medium such that the central ray of said radiation is in a plane substantially perpendicular to said axis.

3,953,106

IMAGE STABILIZING OPTICAL SYSTEM

Hiroshi Furukawa, Tokyo, and Akira Tajima, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 405,631, Oct. 11, 1973, abandoned, which is a continuation of Ser. No. 209,619, Dec. 20, 1971, abandoned. This application June 18, 1974, Ser. No. 480,467
Claims priority, application Japan, Dec. 28, 1970, 45-128422
Int. Cl.² G02B 23/00
U.S. Cl. 350—16 **4 Claims**

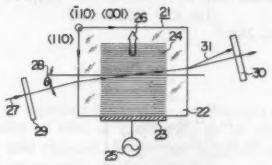


1. In an image stabilizing lens system for an optical instrument having means for stabilizing said lens system and having an imaging lens system therein comprising an afocal inverted Galileian telescopic system section arranged in front of said imaging lens system, the rearmost lens element of said inverted Galileian telescopic system being defined by a spherical front surface and a substantially plane rear surface, and pivoted at substantially the center of curvature of said rearmost lens element for being maintained by said stabilization means in fixed angular orientation with respect to an original line of sight in order to compensate for jiggle of the image at the focal plane despite accidental angular displacement of said instrument with respect to the original line of sight and wherein a relationship between the index of refraction, N, of a transparent material employed in said rearmost lens element and the angular magnification power, M, of said entire afocal inverted Galileian telescopic system is established so that M is substantially equal to $N - 1$.

3,953,107
ACOUSTO-OPTIC FILTER

Tsutomu Yano, Kawasaki; Yasumasa Nabeta, Tokyo; Koetsu Saito, Kawasaki, and Akinori Watanabe, Komae, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed July 1, 1974, Ser. No. 485,002
Claims priority, application Japan, July 3, 1973, 48-75583
Int. Cl.² G02F 1/18, 1/32
U.S. Cl. 350—149 3 Claims

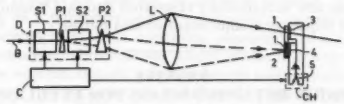


1. An acousto-optic filter comprising:
a medium in which light has two different phase velocities in a propagating direction, means for propagating an ultrasonic wave in said medium, and
means for injecting a light beam into said medium so as to cause far-off-axis anisotropic Bragg diffraction with said ultrasonic wave.

3,953,108
DIGITAL BEAM DEFLECTOR

Klaus Peter Schmidt, Quickborn, and Claus Wiech, Hamburg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 24, 1974, Ser. No. 517,780
Claims priority, application Germany, Oct. 27, 1973, 2353950
Int. Cl.² G02F 1/31
U.S. Cl. 350—150 4 Claims

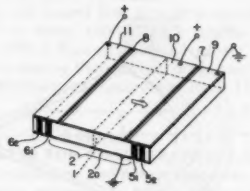


1. Digital beam deflector of the type comprising an electrical control circuit, a plurality of deflection stages each connected to said electrical control circuit and which each comprise an electrooptical polarization switch and a birefringent element, said beam deflector providing output signal radiation in a desired direction and disturbance radiation in undersirable directions, the improvement comprising a lens after the final deflection stage for spatially separating the signal radiation from the disturbance radiation and a radiation chopper after the lens comprising a plurality of signal variable radiation deflecting elements, each of said elements being connected to and being adjustable by an electronic signal from said control circuit which also controls the polarization switches in the deflection stages to selectively block the disturbance radiation separated by said lens.

3,953,109
DOMAIN SWITCHING ELEMENT

Akio Kumada, Kokubunji, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 7, 1974, Ser. No. 449,078
Claims priority, application Japan, Mar. 7, 1973, 48-26116
Int. Cl.² G02F 1/05
U.S. Cl. 350—160 R 9 Claims

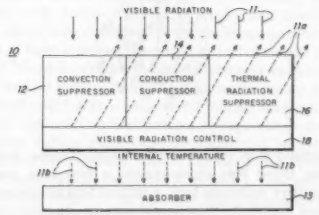


1. A domain switching element comprising:
an irregular ferroelectric crystal plate having first and second surfaces opposite one another, said plate containing multi-domain nucleus regions disposed in spaced-apart portions thereof;
a first electrode layer disposed on a first portion of said first surface of said plate between said multi-domain nucleus regions therein;
second and third electrode layers disposed on second and third portions of said first surface of said plate, respectively spaced apart from opposite edges of said first electrode layer, so as to overlie said multi-domain nucleus regions disposed in said spaced-apart portions of said plate, respectively; and
a fourth electrode layer disposed on a first portion of said second surface of said plate between said spaced-apart portions of said plate containing said multi-domain nucleus regions.

3,953,110
TRANSPARENT THERMAL INSULATING SYSTEM

Day Charoudi, 5A Newton Place, Somerville, Mass. 02143

Filed May 20, 1974, Ser. No. 471,767
Int. Cl.² B32B 7/00; F24J 3/02; G02F 1/19
U.S. Cl. 350—161 16 Claims



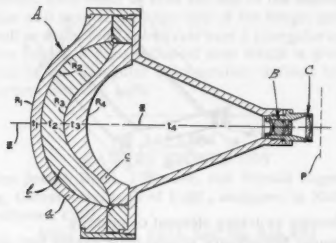
1. A transparent thermal insulating system having controllable transmissivity to visible radiation comprising:
a first layer transparent to visible radiation;
a second layer transparent to visible radiation and spaced from said first layer;
partition means for separating the space between said layers into compartments;
a thermal radiation suppressor device for suppressing thermal radiation transmission; and
a variable transparency thermal control device for controlling transmission of visible radiation as a function of temperature.

3,953,111

NON-LINEAR LENS

Ralph W. Fisher, St. Charles; George Licis, Manchester, and Wayne W. Schurter, Bridgeton, all of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Nov. 4, 1974, Ser. No. 520,487
Int. Cl.² B29D 13/18; G02B 13/08
U.S. Cl. 350—189 10 Claims



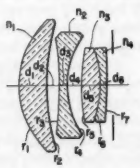
1. A non-linear lens comprising first lens means for distorting a scene in the field of view for the lens such that objects in the vicinity of the optical axis are given substantially greater prominence than objects in the peripheral region of the field of view, and second lens means for forming a real image of the scene as distorted by the first lens means, whereby objects in the vicinity of the optical axis will occupy a disproportionately large area of the real image and objects in peripheral regions of the scene will occupy a disproportionately small area of the real image.

3,953,112

BEHIND-STOP TYPE COMPACT PHOTOGRAPHIC LENS SYSTEM

Toshihiro Imai, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 17, 1974, Ser. No. 471,058
Claims priority, application Japan, May 19, 1973, 48-55192
Int. Cl.² G02B 9/20
U.S. Cl. 350—227 3 Claims



1. A behind-stop type compact photographic lens system comprising three lens components, a first lens component being a positive meniscus lens, a second lens component being a biconcave lens and a third lens component being a cemented positive doublet lens, and said behind-stop type photographic lens system satisfying the following conditions:

1. $0.7f < r_3 < 0.8f$
2. $f < -r_5 < 1.4f$
3. $0.6f < r_8 < 0.92f$
4. $0.29f < -r_6 < 0.38f$
5. $0.08f < d_2 + d_4 < 0.11f$
6. $1.65 < n_2 < 1.72$
7. $6 < \nu_3 - \nu_4 < 10$

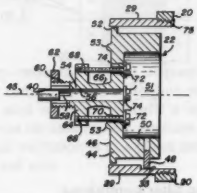
wherein reference symbol f represents a focal length of the lens system as a whole, reference symbols r_2, r_3, r_5 and r_6 respectively represent radii of curvatures of the surface of the first lens component on the image side, the surface of the second lens component on the object side, the surface of the third lens component on the object side and the cemented surface of the third lens component, reference symbols d_2 and d_4 respectively represent airspaces between the first and second lens components and between the second and third lens components, reference symbol n_2 represents the refractive index of the second lens component, and reference symbols ν_3 and ν_4 respectively represent Abbe's numbers of the front and rear lens elements of the third lens component.

3,953,113

LASER MIRROR MOUNTING DEVICE

William A. Shull, Portola Valley, Calif., assignor to Liconix, Mountain View, Calif.

Filed Nov. 8, 1974, Ser. No. 522,093
Int. Cl.² G02B 5/08
U.S. Cl. 350—288 13 Claims



1. A removable laser mirror mounting device for insertion into a housing of a multi-wavelength laser which is adapted to allow for the exchange of mirror mounting device sets associated with each wavelength of operation of the laser without requiring that the laser be realigned after each exchange of the laser mirror mounting device sets, the housing of the multi-wavelength laser having an internal reference surface, said device comprising:

a main body forming an external reference surface for mating with the internal reference surface of the housing when said device is inserted into said housing;

a mirror associated with one of the wavelengths of operation of said laser;

holding means connected to said main body for receiving and fixedly holding said mirror; and

adjusting means connected to said main body and to said holding means for adjusting the position of said holding means with respect to said external reference surface such that the reflective surface of said mirror may be positioned in a predetermined manner relative to said internal surface and said device may then be removed from and subsequently reinserted into said housing without requiring readjustment of said mirror.

3,953,114

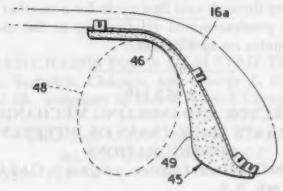
CUSHION RETAINING MEANS FOR EYEGLASSES

William T. Bidgood, 1032 W. Peachtree St., Atlanta, Ga. 30309

Filed Sept. 23, 1974, Ser. No. 508,415
Int. Cl.² G02C 5/16
U.S. Cl. 351—123 3 Claims

1. Retaining means for eyeglasses comprising a cushion member for attaching to the temple pieces of eyeglasses, said cushion member including a generally wedge-shaped cushion member having a thinner portion and a thicker portion, and attaching means fixed to said cushion member for removably fixing said cushion member to the lower edge of said temple piece, said attaching means being bendable to conform to the shape of said lower edge of said temple piece, said attaching means being so constructed and arranged to locate said cushion member so that said thinner portion is engageable with the top of the ear of a wearer and said thicker portion is immediately rearward of the ear, and a weight carried by the extending end of said temple piece rearward of said cushion member,

said weight being just sufficient for holding said thicker portion down behind the ear to prevent forward movement of said temple piece, the arrangement being such that said cushion member is selectively movable along said lower edge to retain said thicker portion immediately rearward of the ear said attaching means comprising a channel, said channel including



a plurality of segments adjacent to one another and separated by a plurality of slits, at least one pair of clamp members carried by said channel and formed integrally with said segments and engageable with said temple piece, said channel being bendable selectively to provide a concave portion and a convex of said attaching means, said clamp members being located at said convex portion.

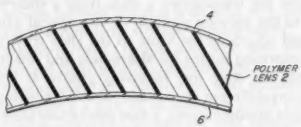
3,953,115
METHOD FOR PROVIDING AN ABRASION RESISTANT COATING FOR PLASTIC OPHTHALMIC LENSES AND THE RESULTING LENSES

Hollis E. French, North Chelmsford, and Jurgen M. Kruse, Lincoln, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Continuation-in-part of Ser. No. 342,101, March 16, 1973, abandoned. This application July 5, 1973, Ser. No. 376,505

Int. Cl.² G02C *7/02;* **B32B** *27/28*

U.S. Cl. 351—166 **25 Claims**



1. A process for forming an abrasion resistant, adherent coating on a polymeric optical component, comprising:

a. forming a solution consisting essentially of a partially hydrolyzed vinyltri(lower alkoxy)silane in a water-miscible, volatile, organic solvent wherein said partially hydrolyzed vinyltri(lower alkoxy)silane is present from about 25 to about 75% by weight;

b. applying a thin, uniform coating of said solution to a clean surface of the optical component;

c. maintaining said coated component in an environment having a relative humidity greater than or equal to 70% and at a temperature of from about 25°C. to about 80°C.; and,

d. dehydrating said coated component at an elevated temperature below the temperature at which the component degrades until an adherent, abrasion resistant coating is formed.

19. A process for forming a thin, abrasion resistant, adherent, optically clear coating on a polymerized diethylene glycol bis(allyl carbonate) ophthalmic lens, comprising:

a. forming a solution consisting essentially of vinyltriethoxysilane in a water-miscible, volatile, organic solvent, said vinyl triethoxysilane being present in an amount of about 50% by weight;

b. partially hydrolyzing said solution by contacting it with from about 7 to about 30 parts by weight of 0.1N hydrochloric acid per 100 parts of solution;

c. applying a coating of from about 3 to about 6 microns of said partially hydrolyzed solution to a clean surface of said lens;

d. maintaining said coated lens for at least about 24 minutes at a temperature between about 30°C. and 50°C. and a relative humidity above 90%; and,

e. dehydrating said coated lens at a temperature of from about 80°C. to about 100°C. and a relative humidity below about 10% to form an abrasion resistant, adherent, optically clear coating thereon, said dry coating having a thickness of from about 1.5 microns to about 3 microns.

3,953,116
EXPOSURE METER FOR PHOTOGRAPHIC CAMERAS

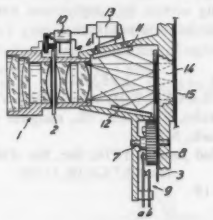
Johann Roth, Schwabhausen, and Robert Flandorfer, Munich, both of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 3, 1974, Ser. No. 529,045

Claims priority, application Germany, Dec. 4, 1973, 2360356

Int. Cl.² G03B *7/08*

U.S. Cl. 352—141 **2 Claims**



1. An exposure control mechanism for motion picture cameras including an objective lens, a diaphragm for regulating the light passing through said lens, an electronic control circuit including a photosensor and motor means coupled to said diaphragm, a picture frame, a shutter having a sector blade periodically covering said frame during operation of said shutter, light reflector means on said blade, said photosensor being located within said camera and positioned to receive light from said reflector means, whereby said control circuit initiates operation of said motor means in accordance with the intensity of light received from said reflector means during the time said frame is covered by said sector, and switching means coupled to said shutter disabling said motor means during the time period said frame is uncovered by said sector blade, said electronic control circuit utilizing a storage condenser receiving a charge voltage pulse from the sequential periodic illumination of said photosensor, said condenser being connected to a resistor forming therewith an RC network, the time constant of which is a multiple of the periodic frame sequence exposure time of said camera.

3,953,117
SINGLE IMAGE PLANE TWO COLOR PHOTOCHROMIC DISPLAY TECHNIQUE

Berry A. Cannon, Toms River, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

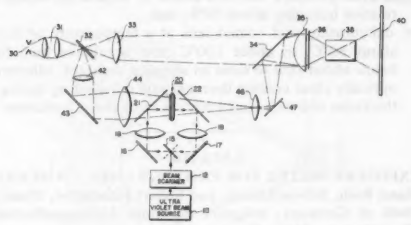
Filed June 10, 1975, Ser. No. 585,650

Int. Cl.² G03B *21/26;* **G11B** *7/02;* **G02B** *5/23, 27/14*

U.S. Cl. 353—11 **7 Claims**

1. A display system for projecting light from a broadband light source through an optically transparent information-bearing medium and onto a viewing screen comprising a thin

film substrate transparent to visible radiation, a first photochromic layer disposed on one side of said thin film, a second photochromic layer disposed on the opposite side of said film, said photochromic layers being normally transparent to visible light, said first and second photochromic layers changing to mutually distinct colors in response to ultraviolet radiation,



means for scanning a selected one of said two photochromic layers with ultraviolet radiation to write characters on said selected layer of the color corresponding to that layer,

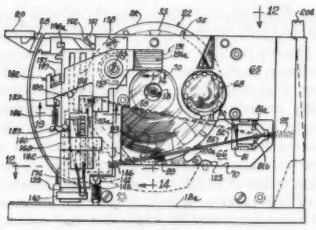
said layers and said film substrate being disposed in a path of said projected light whereby said characters appear on the viewing screen in conjunction with details of said information-bearing medium.

3,953,118

RESET MECHANISM FOR AN AUDIO-VISUAL DEVICE

Anatoli Brushenko, Elmhurst, Ill., assignor to GAF Corporation, New York, N.Y.

Filed June 5, 1974, Ser. No. 476,716
Int. Cl.² G03B 31/06
U.S. Cl. 353—19 10 Claims



1. In an audio-visual device of the type adapted for use with a removable audio-visual unit including a transparency holder and an associated sound record disc having a plurality of grooves therein for recorded messages, wherein such holder mounts a plurality of discrete image transparencies arranged in a continuous pattern for successive visual display and wherein said record includes separate recorded messages corresponding to respective transparencies on said holder, the improvement comprising:

a. an advancing mechanism operable successively through a first cycle for intermittently moving said holder thereby to present said transparencies in seriatim for visual display;

b. a tone arm;

c. indexing mechanism operated in response to actuation of said advancing mechanism and engaging said tone arm for intermittently moving the latter to successive incremental positions corresponding to the starting grooves of respective messages on said record, said indexing mechanism including a reciprocally and slidably mounted member engaging said tone arm to effect positioning thereof; and

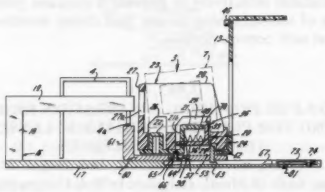
d. a reset mechanism independent of said audio-visual unit, said reset mechanism being connected with said indexing mechanism for automatically positioning said slidable member to locate said tone arm in a position corresponding to the beginning groove of a selected one of said messages in response to movement of said advancing mechanism through said first cycle for a number of times bearing a predetermined relationship to the number of transparencies on said holder.

3,953,119

SLIDE PROJECTOR AND INDEXING MECHANISM FOR ALTERNATE SLIDE TRAYS OF DIFFERENT CONFIGURATIONS

Jean-Paul Erchoff, Belsele, Belgium, assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 376,181, July 3, 1973, abandoned. This application Sept. 19, 1974, Ser. No. 507,477
Int. Cl.² G03B 23/04, 23/06
U.S. Cl. 353—116 25 Claims



1. In a slide projector of the type including a slide tray receiving groove formed by first and second side walls for holding a slide tray having a plurality of spaced apart slide receiving spaces, and a slide carrier slidably disposed for reciprocating movement transversely to the slide tray receiving groove for transferring a slide from a slide tray installed therein to the viewing position on the optical axis of the projector and returning the same to the slide tray, the improvement comprising means for alternately and selectively receiving within the slide tray receiving groove at least two slide trays having different shapes and racks of indexing projections of different configurations, a first one of said slide trays having its rack of indexing projections located closer to said first side wall of said groove than to the second side wall thereof, a second of said slide trays having its rack of indexing projections located closer to the second wall of said groove, said receivng means including tray guide means fixedly disposed within the slide tray receiving groove and having a contoured surface corresponding to and adapted to slidably engage, support and guide either of the alternate slide trays; and an indexing mechanism for incrementally advancing either of said alternate slide trays disposed within the slide tray receiving groove to sequentially present slides contained in either of said slide trays for viewing; said indexing mechanism including an indexing lever slidably and pivotally mounted on the projector adjacent said tray receiving groove, a first pawl carried on said lever at one end thereof adapted for incremental engagement with the indexing rack of the first slide tray, and a second pawl carried on said lever at the other end therof adapted for incremental engagement with the indexing rack of the second tray; an actuating member attached to the indexing lever for imparting the required movement to said indexing lever; and a camway formed in the slide carrier in operative engagement with said actuating member for longitudinally moving the indexing lever to disengage the first and second pawls from the indexing racks of the first and second slide trays respectively and pivotally moving said lever to align the pawls with the next projection of the respective indexing racks

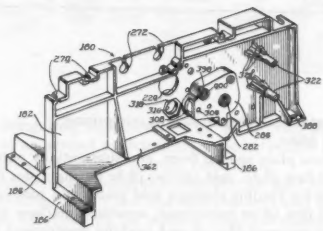
upon withdrawal of the slide carrier from the projector, and for longitudinally moving said indexing lever to engage the pawls with the next indexing projections on the slide trays and pivotally moving said lever through an arcuate extent corresponding to the distance between two adjacent projections on the racks of each tray to advance the selected slide tray to the next slide position upon insertion of the slide carrier into the projector.

3,953,120

MOLDED CHASSIS FOR A FILM STRIP PROJECTOR

Frank C. Badalich, Chicago, and George J. Pawl, Norridge, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1975, Ser. No. 539,833
Int. Cl.² G03B *21/10, 21/28*
U.S. Cl. 353—119 **14 Claims**



1. A chassis for mounting mechanical and electrical components to provide a film strip projector for sequentially projecting images frame by frame upon a screen, which chassis comprises a unitary molded structure including:

an upstanding generally planar web defining a mounting body having front and rear surfaces;

a strengthening flange substantially circumscribing said mounting body web;

mounting means formed integral with said web and flange for mounting a film strip storage compartment;

mounting means formed integral with said web and flange for mounting a light source compartment;

mounting means integrally formed on said mounting body web for mounting a pair of slotted film guide rails;

mounting means integrally formed on said mounting body web for mounting a drive motor;

journal means formed integrally with said mounting body web for journalling a film drive and framing means; and

a lens aperture formed in said mounting body web.

3,953,121

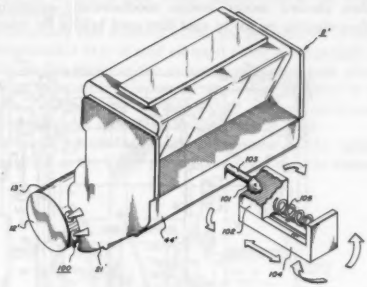
ARTICULATED DEVELOPMENT APPARATUS

Louis W. Reichart, Jr., Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1974, Ser. No. 518,337
Int. Cl.² G03G *15/09*
U.S. Cl. 355—3 DD **17 Claims**

1. In a magnetic brush development apparatus for developing images on a moving imaging surface arranged for movement about an axis of rotation, said apparatus including at least one magnetic brush development member for applying developer to said surface where it moves about said axis, said member extending across said imaging surface from side-to-side of said member to define a gap therebetween extending from said imaging surface to said member, the improvement wherein, said apparatus further includes:

means for maintaining said gap substantially constant from side-to-side of said member, said maintaining means including means for compensating for runout of said imaging surface and for side-to-side phase variations in said runout, said compensating means including means for supporting said development member for movement toward and away from said imaging surface, said supporting means including means for supporting said member for side-to-side tilting movement with respect to said imaging surface.

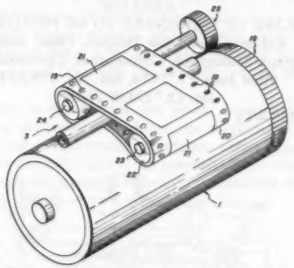


3,953,122

DOCUMENT ORIGINAL HANDLING SYSTEM

David Athelton Walker-Arnott, Bletchley, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1974, Ser. No. 526,560
Int. Cl.² G03G *15/00*
U.S. Cl. 355—12 **21 Claims**



1. In a reproducing machine including means for forming an image of information on an original and means for transporting said original past said imaging means the improvement wherein, said transport means comprises:

a strip member having a plurality of original receiving pockets and means for moving said member past said imaging means with said pockets arranged to present said originals to said imaging means for forming said image.

3,953,123

TRANSPORT APPARATUS FOR AN AUTOMATIC MICRO-IMAGE VIEWER PRINTER MACHINE

Alexander Jesensky, Barrington; Kenneth J. Fedesna, Des Plaines, and Thomas V. De Ryke, Libertyville, all of Ill., assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

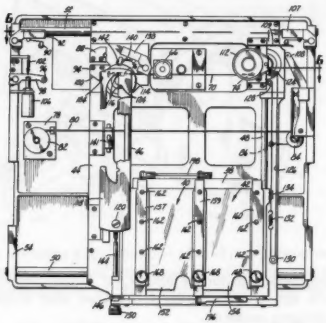
Filed Jan. 30, 1975, Ser. No. 545,392
Int. Cl.² G03B *13/28, 27/42, 27/44*
U.S. Cl. 355—45 **35 Claims**

20. Apparatus for displaying and reproducing micro-images disposed on film cards, comprising:

means for projecting said micro-images for display and reproduction;

a film card holder for receiving film cards; and

means for transporting said film card holder through said projecting means, said transporting means including a first electric motor, means mechanically coupling said first electric motor to said film card holder for transporting said film card holder in a first predetermined direction, a second electric motor and means mechanically coupling said second electric motor to said holder for transporting said holder in a second direction opposite said first predetermined direction, said second electric motor being operative to exert a preloading force on said holder in a direction opposite the force provided by said second motor.



3,953,124

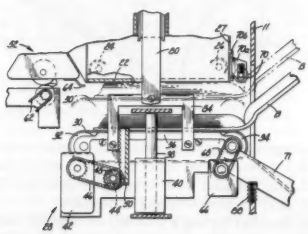
HANDLING OF ORIGINALS TO BE PHOTOCOPIED

James A. Kolibas, Broadview Heights, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed June 17, 1974, Ser. No. 479,651

Int. Cl.² G03B 27/62

U.S. Cl. 355—75 **9 Claims**



1. A photocopying machine comprising:

an optical system terminating in an original illumination station comprising a fixed transparent platen;

a back-up platen opposing said transparent platen;

document transport means for feeding documents one by one between said platens;

means mounting said transport means and back-up platen for movement bodily towards and away from said transparent platen and maintaining the same in parallelism therewith; and

means for jointly fixing said transport means and said back-up platen at any selected spacing from said transparent platen to accommodate three-dimensional originals of varying thicknesses between said transparent platen and said transport means and back-up platen.

3,953,125

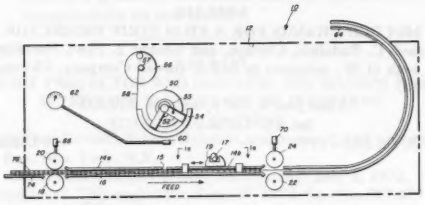
CONTACT COPYING APPARATUS FOR REPRODUCING X-RAY FILMS AND THE LIKE

Warren J. Bost, 1901 S. Main St., Belle Glade, Fla. 33430

Filed Aug. 26, 1974, Ser. No. 500,543

Int. Cl.² G03B 27/78

U.S. Cl. 355—83 **20 Claims**



1. Contact copying apparatus comprising:

a first plate;

a second plate spaced from, and substantially parallel with said first plate, said second plate having a slot therein;

means for feeding through said plates and past said slot a first film of an unexposed, sensitized medium and a second, exposed film of said medium superposed with said first film;

means for controlling the rate of feed of said films between said plates;

a source of electromagnetic energy spaced from said slot;

means for varying the amount of electromagnetic energy passing through said slot; and

means for operating said feed rate controlling means independent of the operation of said electromagnetic energy varying means.

3,953,126

OPTICAL CONVOLUTION VELOCIMETER

Dong Guen Kim, Xenia, and Gary Arnold Dubro, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,368

Int. Cl.² G01P 3/36

U.S. Cl. 356—28 **1 Claim**

1. A fluid flow velocimeter comprising:

a. a flow channel having a first and a second wall for containing the said fluid flow and providing a direction of flow parallel to the said first and second wall;

b. a double-faced light reflective element positioned in the said first wall;

c. a light source;

d. a first and a second photodetector;

e. a lens positioned in the said second wall collimating the light from the said light source and passing the collimating light through the said fluid flow to the said double-faced light reflective element and for focusing the reflected light from one face of the double-faced light reflective element onto the said first photodetector and the reflected light from the other face of the reflective element on the said second photodetector;

f. means including a differential amplifier cooperating with the said first and second photodetectors for providing an output signal responsive to the difference in light intensity detected by the said first and second photodetectors; and

g. means for displaying the frequency of the said output signal.

3,953,127

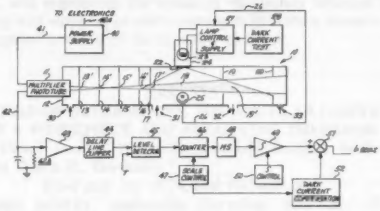
PHOTON-COUNTING INTEGRATING NEPHELOMETER

Norman C. Ahlquist; Alan P. Waggoner, and Robert J. Charlson, all of Seattle, Wash., assignors to Battelle Development Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 435,734, Jan. 23, 1974, abandoned, which is a continuation of Ser. No. 351,609, April 16, 1973, abandoned. This application Aug. 16, 1974, Ser. No. 498,278

Int. Cl.² G01N *21/00*

U.S. Cl. 356—103 **46 Claims**



1. An integrating nephelometer for monitoring the visual qualities of an aerosol by determining the extinction coefficient due to light scattering thereof, comprising:

a. a housing which includes a chamber, an inlet means for introducing the aerosol into said chamber and an outlet means for removing the aerosol from said chamber,

b. means within housing which defines a cone of observation of said aerosol in said chamber, said cone of observation having an axis,

c. a light source producing a continuous light output having a cosine emission characteristic,

d. means positioning said light source so that said light sorce output illuminates said cone of observation and so that the maximum of the cosine emission characteristic lies at right angles to the axis of said cone of observation,

e. a highly-sensitive, measurement photoelectric detector, and means positioning said measurement photoelectric detector with respect to said housing so that the portions of said light source output which are scattered by said aerosol and which pass through the vertex of said cone of observation are incident upon said measurement photoelectric detector, whereby said measurement photoelectric detector produces an output signal including a pulse for each photoelectron resulting from a detected photon and also including noise,

f. a photon-detecting apparatus including means for removing said noise from said output signal and for providing an output pulse for each of said photoelectrons resulting in a pulse in said output signal whose amplitude exceeds the expected level of said noise, and

g. measurement means coupled to said photon-detecting apparatus for converting the rate of occurrence of such output pulses into an output signal related in value to the desired extinction coefficient.

3,953,128

PROCESS AND APPARATUS FOR FILAMENT OR SLIT SIZE MONITORING

Sandor Holly, Falls Church, Va., assignor to Atlantic Research Corporation, Alexandria, Va.

Continuation-in-part of Ser. No. 451,332, March 25, 1974, abandoned. This application Jan. 6, 1975, Ser. No. 539,198

Int. Cl.² G01B *11/10*

U.S. Cl. 356—106 R **160 Claims**

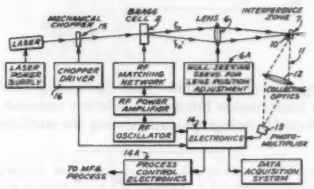
47. A process for sensing without contact the width of an elongated element, comprising:

1. producing a pair of coherent electromagnetic radiation beams of substantially the same size and intensity, one of said beams having a different frequency from said other beam, the frequency difference being within the radio frequency range;

2. converging said beams to form a laterally-moving fringe pattern having a first fringe period within the zone of convergence;

3. positioning said element within the interference zone, the longitudinal axis of said element being substantially normal to the plane of the convergent beams, said element being substantially spatially stationary relative to said zone, whereby the moving fringe pattern continuously sweeps across said element transversely; and

4. determining the AC signal component of the resulting radiation as the fringe pattern sweeps across the element;



5. said process including the step of adjusting the value of the fringe period of said pattern relative to the element width to a fringe period having a size capable of producing a minimum AC signal, wherein said AC minimum signal obtained at said fringe period size indicates an element width equal to said fringe period times a constant or a whole integer multiple of said fringe period plus the fringe period times a constant, said constant being equal to the ratio of the width of said element and said fringe period;

6. said process being employed when, during said step of adjusting the fringe period size, the magnitude of the DC component of said resulting radiation varies in an amount from substantially zero to an amount which results in an element width-sensing within a predetermined magnitude of width-sensing error for the given element.

3,953,129

TESTING AND INSPECTING LENS BY HOLOGRAPHIC MEANS

Bernard P. Hildebrand, Richland, Wash., assignor to The Unites States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 9, 1975, Ser. No. 539,885

Int. Cl.² G01B *9/02*

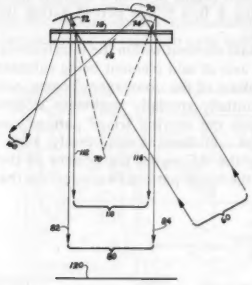
U.S. Cl. 356—109 **5 Claims**

1. In a process for holographically testing concave and convex surfaces wherein a hologram serves as both a master and an illuminating source for said surfaces to be tested, said process requiring no overpower optics, mirrors or beamsplitters, said process of making a hologram of a master surface comprising the steps of

illuminating said master surface with a first beam of coherent light diverging from a point near the focal plane of said master surface through a photographic plate, said photographic plate being further illuminated with a second coherent beam of arbitrary curvature,

forming a plurality of holograms on said photographic plate including a transmission hologram of said first beam by interference of said first and second beams, and a reflection hologram of a third beam comprising said first beam reflected from said master surface, by interference of said

second and third beams,



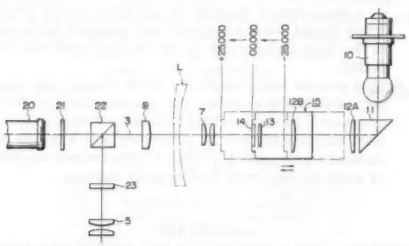
placing said photographic plate containing said reflection and transmission holograms before a concave or convex surface for holographically testing the surfaces thereof.

3,953,130

AUTOMATIC DIGITAL INDICATING LENS METER

Tadashi Iizuka, Machida, Japan, assignor to Kabushiki Kaisha Hoya Lens and Kabushiki Kaisha Sokkisha, both of Tokyo, Japan

Filed June 12, 1974, Ser. No. 478,883
Int. Cl.² G01B 9/00
U.S. Cl. 356—125 6 Claims



1. An automatic lens meter for digitally indicating the diopter of a lens, comprising:

an optical system which includes means for projecting a beam of light along an optical axis, a target having at least one circular luminous point and adapted to be moved reciprocally along said axis within a predetermined range, a spaced pair of collimators positioned along said axis, and means for mounting said lens intermediate the collimators substantially on said optical axis;

an image pickup system positioned on an extension of said optical axis, said pickup system including a vidicon camera having a photo-electric surface upon which an image from said circular luminous point is directed by said optical system whereby the vidicon camera converts the image into electrical signals in accordance with the area of said image on the photo-electric surface;

a motor connected to said target; and

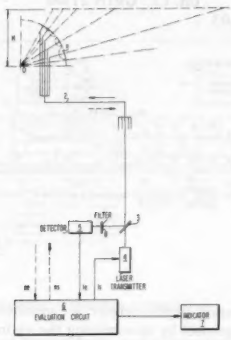
circuit means for energizing said motor to reciprocate the target and for responding to the electrical signals to provide a digital indication of the diopter of said lens as a function of the minimum area of said image.

3,953,131

OPTO-ELECTRONIC ANTENNA SYSTEM FOR LASERS

Hans Ernst Britz, Ludwig Quidde Str. 23, 6000 Frankfurt am Main 56, Germany

Filed Mar. 4, 1974, Ser. No. 447,814
Claims priority, application Germany, Mar. 2, 1973, 2310515; Oct. 4, 1973, 2349807; Dec. 6, 1973, 2360781
Int. Cl.² G01B 11/26
U.S. Cl. 356—141 10 Claims



1. An opto-electronic antenna system for transmitting and/or receiving laser radiation comprising:

a plurality of stationary antennas disposed on a prescribed geometrical surface, the optical axis of each antenna being disposed at a solid angle with respect to the optical axes of the other antennas and intercepting a single base point; and

means for effecting cyclical scanning of said plurality of antennas,

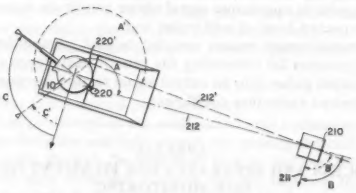
wherein said geometrical surface is that of a plurality of spherical sections having different diameters, which are subdivided along the same longitudinal and latitudinal lines, at the intersection of which said antennas are disposed.

3,953,132

SYSTEM FOR REGISTERING POSITION OF ELEMENT

Paul F. Michelsen, Kensington, Md., assignor to RMC Research Corporation, Bethesda, Md.

Division of Ser. No. 268,632, July 3, 1972, Pat. No. 3,798,795.
This application Mar. 22, 1974, Ser. No. 453,974
Int. Cl.² G01B 11/26
U.S. Cl. 356—152 8 Claims



1. The method of measuring the angular position of an element movable about an axis relative to a supporting structure, comprising producing electrical pulses at substantially uniform intervals, rotating a member about said axis at uniform speed, transmitting a first beam of light from a fixed source to a photosensitive device through a fixed path interrupted by said rotating body, altering the amount of light entering said photosensitive device at one point in the rotation of said rotating body, transmitting a second beam of light from

a source on said movable element through a variable path spaced at an angle from said first path according to the position of said element and interrupting said beam by said rotating body, altering the amount of light entering said photosensitive device at another point in the path of rotation which is spaced from said one point an angular distance equal to the angle of movement of the movable element, counting said electrical pulses, initiating the counting of the pulses by change in energization of said photosensitive device upon altering of the light at said one point, and discontinuing the counting of said pulses by altering the energization of said photosensitive device upon altering of the light at said another point, and registering the count of the pulses between the starting and stopping of said counting to provide a measure of the angular position of the movable element.

3,953,133

METHOD OF DETERMINING THE ANGULAR POSITION OF A WORKPIECE AND APPARATUS THEREFOR

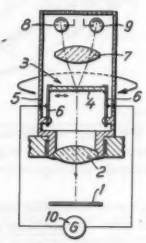
Hans-Dieter Jacoby, Werdorf, Germany, assignor to Ernst Leitz G.m.b.H., Germany

Filed July 10, 1974, Ser. No. 487,304

Claims priority, application Germany, July 11, 1973, 2335227

Int. Cl.² G01B 11/26

U.S. Cl. 356—152 **10 Claims**



1. A method for determining relative to a reference direction the angular position of a workpiece having an optically detectable elongate feature, the method comprising the steps of:

imaging said optically detectable feature by an optical imaging system onto a grating of an optical correlator system defined by at least said one grating having grating lines in an image plane of said optical imaging system as well as at least one photoelectric receiver means associated with said grating and scanning said grating to receive light from said grating;

displacing said grating relative to the image of said optically detectable feature; and

angularly displacing said optical correlator system about its optical axis relative to the image, generating electrical signals from said photoelectric receiver means and indicating maximum and minimum values of said signals at the position where said elongate feature extends substantially parallel to said grating lines.

3,953,134

AUTOMOTIVE WHEEL ALIGNMENT INSTRUMENT

Arthur V. Appel, Lake Forest; Robert S. Hampton, Northbrook, and Leonard A. Morrison, Chicago, all of Ill., assignors to Ammco Tools, Inc., North Chicago, Ill.

Filed Sept. 23, 1974, Ser. No. 508,089

Int. Cl.² G01B 11/26

U.S. Cl. 356—155 **9 Claims**

1. An instrument for measuring the angular relationship between the front wheels and frame of an automotive vehicle, comprising

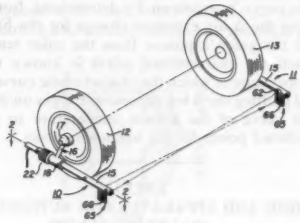
an elongated support member,

means for mounting said support member to one of said wheels in substantial parallelism with the plane of rotation of the wheel and with the forward end of said support member extending forwardly of said wheel,

a target screen,

means mounting said target screen to the other of said wheels in substantial parallelism with the plane thereof and forwardly thereof,

a lamp mounted to said support member near the rearward end thereof,



mirror means mounted to said support member near the forward end thereof for deflecting light from said lamp at substanially a right angle in a direction parallel to the axis of rotation of said one wheel onto said target screen,

an optical system including a reticle mounted to said support member between said lamp and said mirror for focusing an image of said reticle through said mirror means onto said target screen, and

said means for mounting providing the sole support for said support member and being fixedly secured to said support member.

3,953,135

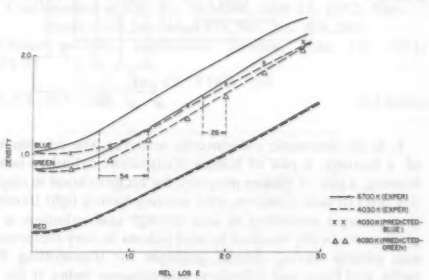
CURVE ANALYSIS METHOD IN COLOR PHOTOGRAPHY

Marilyn Levy, Little Silver, and Milan Schwartz, Neptune, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 4, 1975, Ser. No. 555,323

Int. Cl.² G01J 3/46

U.S. Cl. 356—175 **3 Claims**



1. Method of approximating the characteristic curves of a color film exposed at a variety of color temperatures where the characteristic curve of a film exposed at one color temperature is known, said method including the steps of:

a. exposing a film in a sensitometer to light varying in color temperature to obtain characteristic curves for the exposures at the varying temperatures;

b. processing the film in a color developer;

c. determining the transmission densities of the developed film to red, green and blue light at the varying tempera-

tures and plotting the results as curves relating the red, blue and green densities to relative log exposure;

d. analyzing these curves by placing one over the other so that the red curves are superimposed to obtain the change in blue and green exposure from one color temperature to another;

e. averaging the Δ log exposure determinations and plotting the results as a linear curve relating the Δ log exposure change of blue and green exposure over the temperature range of exposure to the Mired Value; and

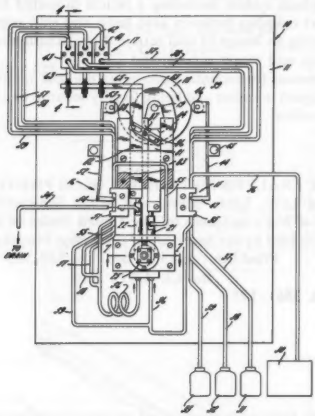
f. approximating the characteristic curve of a color film exposed to any color temperature in which the characteristic curve is unknown by determining from the linear curve the Δ log exposure change for the blue exposure and the green exposure from the color temperature of which the characteristic curve is known to the color temperature of which the characteristic curve is unknown and plotting the Δ log exposure changes on the characteristic curve of the known temperature to produce the predicted points for the unknown curves.

3,953,136

METHOD AND APPARATUS FOR AUTOMATICALLY ANALYZING FLUIDS

Clifford C. Hach, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Filed Mar. 15, 1974, Ser. No. 451,472
Int. Cl.² G01J 3/50
U.S. Cl. 356—181 **5 Claims**



1. In an automatic colorimetric analyzer, the combination of, a housing, a pair of hollow transparent cylinders in said housing, a pair of pistons mounted for reciprocation in respective ones of said cylinders, said housing having light transmitting passages extending to and through said cylinders in regions periodically blocked by said pistons as they reciprocate, said pistons having central passages for transmitting fluid paths, and from said cylinders, said passages being at the top of said cylinders and thus defining air bubble escape path, means including said passages for conveying fluid in a stream from a sample source to first one cylinder and then the other cylinder, valves for selectively blocking said stream between said source and the first cylinder, between said cylinders, and downstream of said second cylinder, a light system including a single lamp and a single photocell for passing and sensing light beams through said cylinders, means for adding a reagent to said sample stream between said cylinders, and means for alternately reciprocating said pistons and operating said valves so as to pump said stream at a uniform measured incremental rate, wipe said cylinders clean, and permit alternate sensing of light beams passing through said cylinders.

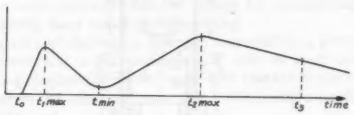
4. The method of automatically analyzing turbid water colorimetrically comprising the steps of directing two beams of light of the same intensity and wave lengths to respective ones of two transparent cells and toward a light sensor, introducing successive samples of the water under test to one of said cells, directing said samples successively from said one cell to the other cell, adding a test reagent to the sample while it is being directed from said one cell to said other cell, alternately blocking said light beam so as to cause said light sensor to read alternately said beams, comparing said sensor reading so as to detect any difference caused by a color change in the combined sample-reagent, and adding a solution to said water samples before they are introduced to said one cell, said solution having tne same effect on turbidity as could later be expected from said reagent.

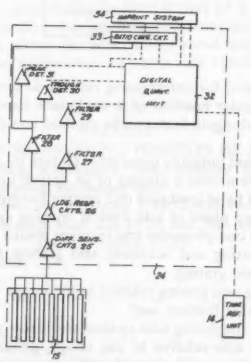
3,953,137

NUCLEAR-BURST STRENGTH DETECTING AND MEASURING DEVICE

Jacques Albert Louis Georges Balut, Arcueil; Pierre Eugene Gerard K. Lemaire, Paris, and Claude Michel Loisy, Antony, all of France, assignors to Etat Francais, Paris, France

Filed Apr. 5, 1971, Ser. No. 131,516
Int. Cl.² G01J 1/42
U.S. Cl. 356—222 **12 Claims**





1. A device for detecting and analyzing in time and form a lumino-thermal radiation signal received from a nuclear-type explosion or burst, said device comprising:

a. an array of photoelectric cells;

b. a polyhedral prism based on a horizontal plane and including a plurality of faces; said photoelectric cells being arranged at the faces of said polyhedral prism and providing electrical outputs dependent upon the received lumino-thermal flux values;

c. electronic means connected to employ said electrical outputs to produce first and second signal pulses respectively upon the successive occurrence of a first (t_{1max}) peak value and a second (t_{2max}) peak value of the received flux, and to produce an intermediate signal pulse at an instant (t_{min}) between the respective instants of occurrence of the said first and second peak values when

the received flux value rises through a predetermined threshold value or passes through a minimum while remaining above said threshold value;

d. timing means connected with said electronic means; and

e. digital processing means connected to receive said signal pulses and to operate in dependence thereupon and in cooperation with said timing means for establishing the relative instants of occurrence of the respective signal pulses to provide an indication of the receipt of radiation that has flux values which vary with time in accordance with a preselected kind of waveform, which is a waveform produced by a nuclear explosion.

3,953,138

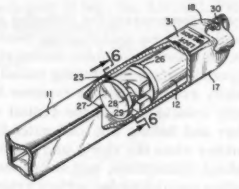
ONE-WAY TWIST LOCK FOR TELESCOPIC TUBES

Harrison William Hine, Pacific Palisades, and Veli A. Saarinen, Carson, both of Calif., assignors to Seaway Supply Company, Los Angeles, Calif.

Filed Jan. 6, 1975, Ser. No. 538,545

Int. Cl.² E04G *25/08*

U.S. Cl. 403—75 **10 Claims**



1. A twist lock mechanism for telescopic tubes, comprising:

a. a first tube having a multi-sided cross section;

b. a second tube telescopically disposed within the first tube;

c. a split lock ring formed with a bore and slidably disposed within the first tube, the lock ring having a multisided external periphery sized to prevent rotation between the lock ring and first tube and a notch in one end intersecting both sides of said split;

d. a lock base fixed to one end of the second tube;

e. an eccentric pin extending from the lock base and disposed within the bore of the lock ring, the eccentric pin and lock ring being structured to wedge and accomplish locking when the tubes are relatively rotated in one direction; and,

f. turn limiting means for preventing the eccentric pin and lock ring from locking when the tubes are relatively rotated in the opposite direction.

3,953,139

BALL JOINT

Yasuo Uchida, Hamamatsu, Japan, assignor to Ishikawa Tekko Kabushiki Kaisha, Tokyo, Japan

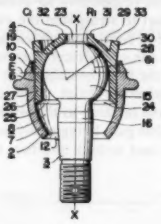
Filed Oct. 24, 1974, Ser. No. 517,407

Claims priority, application Japan, Nov. 6, 1973, 48-125083

Int. Cl.² F16C *11/06*

U.S. Cl. 403—140 **1 Claim**

1. A ball joint comprising a socket including a bore defined by a cylindrical inner wall surface and a converging hemispherical inner wall surface contiguous with said cylindrical inner wall surface and openings each formed at one end of said bore, a ball stud including a spherical head disposed in said bore of said socket and a stem contiguous with said spherical head and extending through one of said openings of said socket, a one piece bearing member arranged between said inner wall surface of said socket and said spherical head of said ball stud for rotatably enclosing said spherical head of said ball stud, said one piece bearing member being made of a relatively hard and resilient plastic material, and a closing member hermetically closing the other of said openings of said socket and fixed to said socket in pressing engagement with an end portion of said one piece bearing member, said one piece bearing member when viewed in longitudinal section being formed with a pair of bearing surface portions facing to each other, each of said bearing surface portions being of paraboloidal shape, said pair of bearing surface portions being disposed on opposite sides of an equator of said spherical head of said ball stud, said pair of bearing surface portions forming a pair of annular bearing zones for supporting said spherical head, each of said pair of bearing surface portions having a maximum diameter near the equator of the spherical head and being contiguous with each other to provide an annular pocket for storing a lubricant between said spherical head and



said bearing member, said one piece bearing member being formed at said end portion thereof with an annular recess which corresponds in axial position to the annular bearing zone of one of said pair of bearing surface portions, so that a closed annular space is formed between said closing member and said bearing member by virtue of the presence of said annular recess and the end portion of said bearing member inside of said annular recess is supported by said closing member, the outer surface of said one piece bearing member is on a substantially cylindrical skirt which is deformed to conform to the shape of the hemispherical inner wall surface of the socket so as to form the paraboloidal shape bearing surfaces when the bearing member is inserted into the bore of the socket.

3,953,140

FASTENER FOR LOCKING A ROTATABLE PART TO A SHAFT

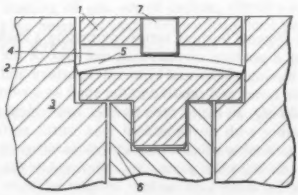
Bertil Carlstrom, Stockholm, Sweden, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 263,990, June 19, 1972. This application Jan. 31, 1974, Ser. No. 438,205

Claims priority, application Sweden, June 18, 1971, 7921/71

Int. Cl.² F16D *1/06*

U.S. Cl. 403—258 **6 Claims**



1. Fastening means for releasably locking a first rotatable part within the walls of a cylindrical opening in a device comprising:

a first rotatable part adapted to be positioned within the walls of a substantially smooth-walled cylindrical opening in a power transmitting device,

a cavity within the first rotatable part,

said cavity extending through the first rotatable part from a first opening to a second opening in the part to provide

a passageway through the part along a diameter of the part,

resilient means in the form of a curved spring loosely positioned within said cavity and shaped to be removable through one of said openings,

a threaded opening in said first rotatable part which provides a third opening into said cavity,

a second rotatable part in threaded engagement within the threaded opening in said first rotatable part,

said second rotatable part terminating in an end surface integral therewith to engage the resilient means,

said second rotatable part responding to the application of a rotary force to rotate in said threaded opening and to press said surface against said resilient means,

said resilient means responding to pressure from said second rotatable part to straighten the curved spring in said cavity causing it to cooperatively engage the substantially smooth walls of the cylindrical opening in the device and thereby enable the first rotatable part to be locked to the device in an arbitrary axial position and an arbitrary turntable position relative to the walls of the opening,

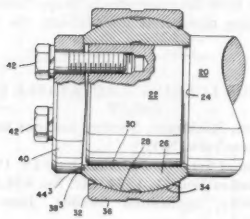
said second rotatable part being easily turned to release said resilient means and unlock the first rotatable part from the device.

3,953,141

LOCK FOR THE INNER RACE OF SELF-ALIGNING BUSHING ON A SHAFT

Hans W. Koch, Levittown, Pa., assignor to Roller Bearing Company of America, West Trenton, N.J.

Filed Feb. 27, 1975, Ser. No. 553,800
Int. Cl.² F16D 1/06
U.S. Cl. 403—259 **8 Claims**



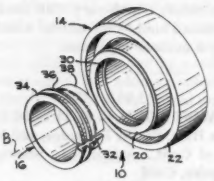
1. A self-aligning bushing setup comprising a shaft, an inner race having a position surrounding one end of the shaft, the inner race having a spherical type outer surface and having an inner and an outer end relative to the shaft as a whole longitudinally speaking, an outer race having a spherical type inner surface mating with the spherical type outer surface of the inner race to enable relative movement as between inner and outer race, an end plate across the outer end of the inner race and having an inner end surface mating with an outer end surface of that inner race, said respective mating end surfaces preventing relative rotation between the end plate and the inner race by at least part of the mating surfaces of the end plate and the inner race having an oblique angle with respect to the axis of the shaft and being assymetrical composed to any figure of rotation developed symmetrically about the axis of rotation of the shaft, means for positively affixing the end plate to the shaft, and means to prevent the inner race from moving axially out of the effective mating position with the end plate.

3,953,142

WEDGE MOUNTED MACHINE ELEMENT

Connor E. Price, and William J. Derner, both of Indianapolis, Ind., assignors to FMC Corporation, San Jose, Calif.

Division of Ser. No. 265,010, June 21, 1972, Pat. No. 3,806,215. This application Sept. 28, 1973, Ser. No. 401,755
Int. Cl.² F16B 2/14, 7/04
U.S. Cl. 403—371 **4 Claims**



3. A mounting construction for clamping a machine member to a mounting surface, said machine member surrounding a central axis, said machine member having at least one axially extending tapered surface and having radially extending surfaces, an axially extending sleeve member having a central axis essentially coincident with the central axis of said machine member and having one end extending beyond said machine member when the sleeve and the machine member are in assembled relationship, said sleeve member having an axially extending tapered wedge surface extending therealong adjacent the opposite end of said sleeve member and in complementary relationship with the axially extending machine member tapered surface for wedging action therewith, said sleeve member having a longitudinal slit therethrough to render the sleeve member deformable to change the diameter thereof, a releasable locking projection on one of said members intermediate the ends thereof, a cavity on the other of said members of greater axial span than said projection, said sleeve member being resilient to permit assembly of said members and engagement of said projection in said cavity, said cavity normally confining said projection in said cavity in any relative angular position of said members with a limited linear axial lost motion therebetween when the sleeve member is relaxed to hold the sleeve member and the machine member in assembled relationship and to permit relative movement of said projection and said cavity parallel to the central axis of said sleeve member from a first unlocked position to a second locked position as the sleeve member is urged into wedging relationship with the machine member, said projection and said cavity having edges substantially perpendicular to said axes and said members disengageable on deformation of the sleeve member, and a radially extending external rib at said one end of said sleeve member.

3,953,143

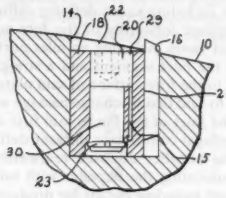
CLAMPING DEVICE

Ernest J. Friedline, Latrobe; Robert N. Mitchell, Ligonier, and Linn R. Andras, Latrobe, all of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Feb. 20, 1975, Ser. No. 551,362
Int. Cl.² F16D 1/06
U.S. Cl. 403—374 **5 Claims**

1. A clamping device for clamping an element against one wall of a hole, such as a blind hole in a support body, said device comprising; a plug member having a slot formed therein such that portions of the outside walls of the plug member are expandable in outward direction, the plug member dimensioned so as to be loosely receivable with said element in said hole with the element engaging one wall of the hole and the plug member being disposed between the ele-

ment and the side of the hole opposite said one wall; a central bore formed in said plug member, and means for expanding



said plug member comprising an eccentric pin located and supported in said central bore.

3,953,144

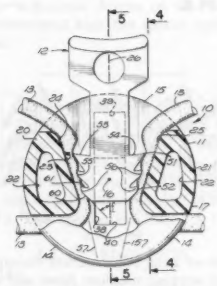
CORD LOCK WITH BOTH SHARP AND DULL TEETH

Ogden W. Boden, 1580 Gaywood Drive, Altadena, Calif. 91001

Continuation-in-part of Ser. No. 439,422, Feb. 4, 1974, abandoned. This application Oct. 17, 1974, Ser. No. 515,465

Int. Cl. F16g *11/04*

U.S. Cl. 403—374 **10 Claims**



1. A cord locking device comprising:

a body containing a tapering passage through which two flexible cords are to extend and which is defined at opposite sides by two cam surfaces facing one another and converging toward one another as they advance in a predetermined direction; and

a slide element having a portion received within said passage and between said converging cam surfaces, and having two sets of teeth at opposite sides of said element facing in opposite directions toward said two cam surfaces respectively to define therewith two spaces along which said two cords extend and within which they are clamped between said teeth and said cam surfaces in a relation locking said cords against movement in said predetermined direction;

said element being movable along an axis in said predetermined direction relative to said body to grip the cords, and being movable in an opposite retracting direction along said axis to release the cords;

each of said sets of teeth including a first relatively sharp tooth having leading and trailing faces converging to a substantially sharp outer edge near a corresponding one of said cam surfaces, and including a relatively blunt tooth with leading and trailing faces and an outer crest surface which faces toward said corresponding cam surface but is less sharp than said edge of the first tooth; said sharp edge and said blunt outer surface of the teeth of one of said sets of teeth having outermost portions lying essentially in a first plane which converges toward said axis and is approximately parallel to the corresponding one of said cam surfaces; and

said sharp edge and said blunt outer surface of the teeth of the other set of teeth having outermost portions lying essentially in a second plane which converges toward said axis and toward said first plane and is approximately parallel to the other of said cam surfaces.

3,953,145

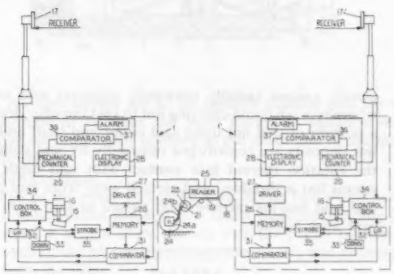
LASER BEAM CONTROL SYSTEM FOR EARTHWORKING OR SIMILAR MACHINES

Ted L. Teach, Springfield, Ohio, assignor to Laserplane Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 378,171, July 11, 1973, Pat. No. 3,873,226. This application Mar. 12, 1975, Ser. No. 557,572

Int. Cl. E01c *19/00;* **E02f** *3/76*

U.S. Cl. 404—84 **6 Claims**



2. Apparatus for controlling the working height of a portion of earthworking tool carried by a mobile vehicle and vertically adjustable relative thereto by power means comprising:

1. a flexible tape having two sets of indicia thereon equally spaced along the tape, one set of indicia corresponding to desired changes in elevation of said earthworking tool portion at predetermined points along the planned path of travel of the vehicle, the other set of indicia indicating the distance between said points;

2. a feeding mechanism for said tape mounted on said vehicle and constructed and arranged to intermittently move said tape past a reading station by a distance equal to the longitudinal spacing of said indicia;

3. means responsive to movement of said vehicle for actuating said feeding mechanism each time the vehicle reaches the next one of said points;

4. electronic means for reading said indicia at said tape reading station, and

5. means for controlling said power means in response to the reading of one set of indicia, thereby adjusting the working height of said earthworking tool portion as the vehicle moves to each said point.

3,953,146

APPARATUS FOR TREATING LINT IN AN AUTOMATIC WASHER

Brian David Sowards, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 15, 1974, Ser. No. 497,770

Int. Cl.[2] F04D *29/70*

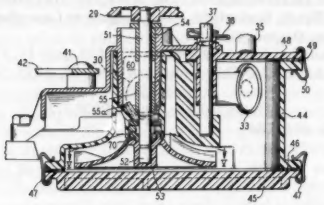
U.S. Cl. 415—121 B **6 Claims**

1. In a clothes washing machine, a pump for passing lint-bearing wash liquid to drain, said pump having a housing forming a pump chamber with an inlet portion about a bearing member, a centrifugal impeller in said chamber for directing said liquid from said inlet portion to an outlet portion of said pump chamber in said housing, a shaft rotatable in said bearing member and extending to said impeller for rotation there-

with through said inlet portion of said pump chamber, wherein:

said impeller has an annular, axially-extending collar about said shaft adjacent and projecting toward said bearing member; and

said housing has a tubular portion extending about said shaft and over said collar and carrying a plurality of circumferentially-spaced, axially-facing teeth members



closely spaced radially outwardly adjacent said collar, whereby wash liquid carrying lint to said impeller deposits a portion of said lint upon said collar and shaft and said lint deposits are centrifuged outwardly by said collar on the rotation thereof into contact with said teeth, and excess lint is shredded and ejected away from said collar and said bearing member and passed to said drain with said wash liquid.

3,953,147

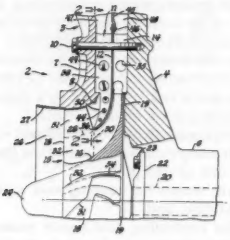
FLUID DYNAMIC MACHINE

Robert H. Aspinwall, Zionsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 27, 1974, Ser. No. 483,877

Int. Cl.² F04D *17/14*

U.S. Cl. 415—143 **1 Claim**



1. A combined high pressure ratio axial-to-radial flow fan and higher pressure ratio centrifugal compressor comprising, in combination, a stator and a rotor rotatably mounted in the stator; the stator defining a single entrance eye to the fan and compressor, the rotor including a hub bearing radially-extending blades, the upstream portions of which define the inducer portion of the centrifugal compressor rotor over the inner part of the blade radius and define axial-flow rotor blades of the fan over the outer part of the blade radius, and the downstream portion of which define the impeller portion having a curved free edge of the centrifugal compressor rotor; the stator including an annular plate having an inlet segment following the curvature of the curved free edge of the impeller portion and defining the forward boundary of the flow passage through the impeller and the rear boundary of a discharge passage from the axial-flow rotor blades, the inner margin of the plate acting as a flow splitter between the fan and compressor; said annular plate having an outlet segment with fore and aft; surfaces extending in a straight line outwardly of the outlet end of the impeller portion; means defining side-by-side located first and second discharge passages on either side of said outlet segment at the outer radial periphery thereof; a diffuser structure including vanes defining diffusing passages from the fan disposed forwardly of the fore surface of said plate, each of said vanes including an inlet portion following the curvature of the inlet segment and a straight radial root segment secured to the fore surface of said plate for directing fan discharge air to said first discharge passage with a pressure ratio of 2 from the inlet of the fan to said first discharge passage, and a centrifugal compressor diffuser defining diffusing passages from the impeller disposed rearwardly of the said plate and communicating the impeller with said second discharge passage and including means for producing a pressure ratio in the range of 4–7 from the inlet of the impeller to said second discharge passage.

3,953,148

CONFIGURATION OF THE LAST MOVING BLADE ROW OF A MULTI-STAGE TURBINE

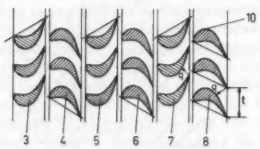
Claude Seippel, and Arnulf Teufelberger, both of Zurich, Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Apr. 26, 1974, Ser. No. 464,678

Claims priority, application Switzerland, Apr. 30, 1973, 6096/73

Int. Cl.² F01D *1/02*

U.S. Cl. 415—199 R **7 Claims**



1. In a turbine of axial construction through which an expanding gaseous working medium flows and which has more than two stages, each stage comprising one fixed blade row and one moving blade row, the improvement wherein the flow discharge cross-section area from only the last moving blade row is larger than the flow discharge cross-section of the penultimate moving blade row by an amount which is from 10 to 40% larger than the ratio of the increase in volume of the flow medium from the penultimate to the last moving blade row.

3,953,149

ENGINE COOLING FAN

John G. Henne, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

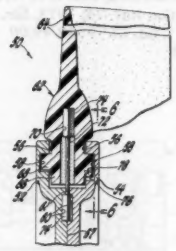
Filed June 17, 1974, Ser. No. 479,805

Int. Cl.² F04D *29/36*

U.S. Cl. 416—136 **2 Claims**

1. An automotive engine cooling fan assembly comprising a split-type hub having mating halves, a plurality of radially extending semicylindrical openings formed to a predetermined depth in the outer peripheral edge of each of said hub-halves adjacent the mating face thereof, a plurality of fan blade subassemblies, each including an asymmetrical fan blade having a round stem formed thereon and mounted in said oppositely disposed semicylindrical openings, radially aligned drive-configuration shaped openings formed along the axis of said round stems and in said mating faces of said hub-halves radially inwardly of said semicylindrical openings, a torsion bar having drive-configuration shaped ends mounted in said respective radially aligned drive-configuration shaped

openings, an arcuate slot formed in each of said hub-halves at an intermediate longitudinal location along each of said semicylindrical openings, collar means formed on each of said stems and positioned in said respective adjacent slots to retain said stems in said semicylindrical openings, and cooperating projecting and additional arcuate slot means formed on each



of said fan blades and one of said hub-halves for establishing maximum and minimum pitch positions by limiting the rotation of said blades about the axis of each of said stems under the action of aerodynamic forces on said asymmetrical fan blades at predetermined high fan speeds against the force of said torsion bar.

3,953,150

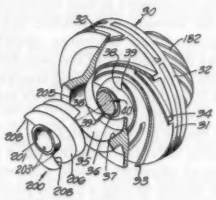
IMPELLER APPARATUS

Hasan F. Onal, Denver, Colo., assignor to Sundstrand Corporation, Rockford, Ill.

Continuation-in-part of Ser. No. 225,096, Feb. 10, 1972, Pat. No. 3,817,653, and a continuation-in-part of Ser. No. 382,374, July 25, 1973. This application June 13, 1974, Ser. No. 479,130

Int. Cl.² F04D *29/26*

U.S. Cl. 416—184 **9 Claims**



1. An impeller assembly for a centrifugal pump comprising a hub;

a plurality of radially outwardly spiralling vanes fixed to said hub, a shroud fixed to said vanes and said vanes having a lead angle at the leading edge of each said vane of less than thirteen degrees (13°) and which increases from said shroud to said hub, curved partial vanes positioned between said spiral vanes, said partial vanes extending to positions at the outer edge of said hub and having leading edges positioned approximately 180° angularly behind the leading edge of a preceding spiral vane and at radial distances from the axial centerline of said hub greater than the radial distances from the axial centerline to the leading edges of said spiral vanes.

3,953,151

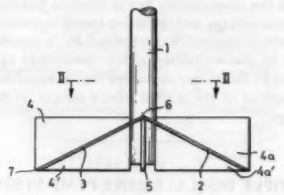
AGITATOR FLOTATION CELL FOR THE PREPARATION OF MINERALS AND COALS

Arnold Leo Aryus, Porz; Friedel Isenhardt, Forsbach, and Bruno Schmitz, Cologne-Holweide, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Jan. 28, 1975, Ser. No. 544,920

Int. Cl.² F04D *29/18*

U.S. Cl. 416—183 **5 Claims**



1. An agitator for use in an agitator floation unit for the preparation of minerals and coals having an agitation shaft with an air supply pipe opening at the lower end of the shaft, comprising:

a vertical shaft;

a disk at the lower end of the shaft having two planar semicircular plates meeting at a radial ridge intersecting the shaft at a right angle thereto with the planar portion of each of the plates depending downwardly and outwardly from the ridge;

first radial vanes fixed to the lower side of the ridge and extending in an axial direction at each side of the shaft;

and second radial vanes each substantially bisecting one of the semicircular plates and extending above the plates with each of said first and second vanes parallel to the shaft axis and extending axially substantially the height of the disk in an axial direction.

3,953,152

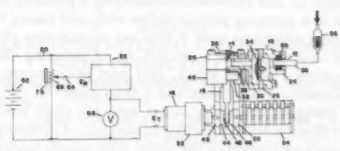
REGULATED FLUID PUMP

Anatole J. Sipin, 221 E. 78th St., New York, N.Y. 10021

Filed Aug. 2, 1973, Ser. No. 385,081

Int. Cl.² F04B *49/06*

U.S. Cl. 417—45 **30 Claims**



1. A regulated fluid pump including, a fluid-filled housing with an inlet and an outlet, mechanical means to propel the fluid between the inlet and the outlet at an average flow rate which has a substantially linear relation to the average speed of the fluid propelling means in a flow range between a minimum value and a maximum value of flow rate,

a DC motor with a constant magnetic field and a wound armature with electrical terminals and an axis, connected to drive the fluid propelling means and terminals and having a characteristic when so connected providing a substantially linear relation between the drive speed and the voltage applied to the armature terminals in a speed range between a minimum value and a maximum value of drive speed corresponding to the minimum and maximum flow rate,

a source of DC electrical power,

electrical regulating means connecting the DC source with the DC motor and regulating the voltage applied to the terminals of the motor armature of a selectable fixed value between a minimum value and maximum value of voltage corresponding to the minimum and maximum values of drive speed so as to maintain the speed of the fluid propelling means at a corresponding fixed value in the linear speed range of the DC motor and the average fluid flow rate at a corresponding fixed value in the linear flow range of the pump,

in which the substantially linear relation between the motor terminal voltage and the drive speed is provided by a fluid propelling means characterized by a mechanical resistance at the maximum drive speed that applies a load torque to the motor armature that is equal to or less than 10 percent of the stalled motor torque at the maximum voltage.

3,953,153

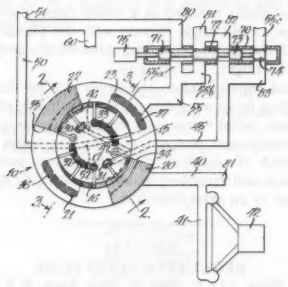
MULTIPLE DISPLACEMENT PUMP SYSTEM AND METHOD

Melvin F. Huber, and Lowell D. Hansen, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 17, 1974, Ser. No. 470,988

Int. Cl.² F04B *23/10, 49/00*

U.S. Cl. 417—204 **10 Claims**



1. A multiple displacement pump system including, a vane pump having a casing and port plate means defining a chamber, a rotor in said chamber and carrying a plurality of vanes movable in a pumping path to define with said casing two sets of pumping chambers with a first set of pumping chambers between said vanes and a second set of pumping chambers radially inward of said vanes, said port plate means having ports providing a fluid inlet and a fluid outlet to one of said sets of pumping chambers and a separate fluid inlet and a separate fluid outlet to the other of said sets of pumping chambers in each revolution of the rotor, inlet means having a first conduit to the inlet port for said one set of pumping chambers and a second conduit to the inlet port for said other set of pumping chambers, outlet means having a first conduit for the outlet port from said one set of pumping chambers and a second conduit for the outlet port from said other set of pumping chambers, and circuit means including control valve means to selectively interconnect certain of said conduits for flow therefrom to a fluid utilization conduit, said control valve means having a first condition wherein both conduits of said outlet means communicate with the fluid utilization conduit, a second condition wherein both conduits of said outlet means communicate with the fluid utilization conduit and said first conduit of the outlet means also communicates with said second conduit of the inlet means, and a third condition wherein said second conduit of the outlet means communicates with the fluid utilization conduit and the first conduit of the outlet means communicates with the first conduit of the inlet means to recirculate the fluid pumped by said one set of pumping chambers through the pump.

3,953,154

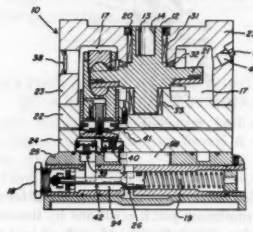
PRESSURE CONTROL AND UNLOADER VALVE

William F. Wanner, 5805 View Lane, Minneapolis, Minn. 55436

Division of Ser. No. 203,562, Dec. 1, 1971, Pat. No. 3,775,030. This application Nov. 15, 1973, Ser. No. 416,253

Int. Cl.² F04B *49/00*

U.S. Cl. 417—270 **12 Claims**



1. A pressure control and unloader valve for controlling the supply of liquid at a predetermined control pressure, said valve comprising:

a liquid pressure control chamber;

a discharge chamber;

a movable valve assembly disposed within a generally cylindrical bore between said pressure control and discharge chambers, wherein said valve assembly includes

a first valve means movable therewith allowing liquid to flow from said pressure control chamber to said discharge chamber when the liquid pressure in said pressure control chamber exceeds the liquid pressure in said discharge chamber but preventing the flow of liquid from said discharge chamber to said pressure control chamber,

a fluid reactive surface exposed to said discharge chamber and responsive to pressure in said discharge chamber, and

seal means for forming an effective seal between said pressure control and discharge chambers, said seal means being disposed about the periphery of said valve assembly and adapted for sliding engagement with said cylindrical bore during movement of said valve assembly within said bore; and

a second valve means in communication with said pressure control chamber for controlling the liquid pressure in said pressure control chamber at said control pressure, said second valve means having a closed position preventing the flow of liquid from said pressure control chamber through said second valve means and an open position allowing liquid to flow from said pressure control chamber through said second valve means, said second valve means being disposed such that said second valve means opens with the liquid pressure in said pressure control chamber and said valve assembly being operatively connected with said second valve means such that pressure in said discharge chamber acting against said fluid reactive surface urges said second valve means toward an open position, said second valve means further including bias means for biasing said second valve means toward a closed position, said bias means being operatively associated with said second valve means and with said fluid pressure control chamber such that the magnitude of said control pressure is determined by the magnitude of said bias means.

3,953,155

PUMP PLUNGER

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Nov. 4, 1974, Ser. No. 520,634
Int. Cl.² F04B 21/04; F01B 31/00
U.S. Cl. 417—554 5 Claims

1. In a downhole submerged pump assembly having a connecting rod affixed to a plunger, said plunger being reciprocatingly received in sealed relationship within a working barrel, and means including a valve arranged to force fluid to flow uphole from the pump assembly when the rod reciprocates the plunger, the improvement comprising:

said plunger having a hollow mandrel, a resilient cylinder, said cylinder being concentrically arranged about said mandrel, seal means by which opposed marginal ends of said cylinder sealingly engage opposed spaced marginal lengths of said mandrel,

said plunger includes an upper and a lower sub, and an upper and a lower compression nut, said upper and lower compression nuts being spaced from one another by said resilient cylinder;

means forming beveled surfaces on each of said nuts and on each marginal end of said resilient cylinder such that each said nut wedgedly engages one opposed marginal end of said cylinder;

said upper and lower subs being spaced from one another by said nuts; means by which said upper sub and said upper nut abut one another and threadedly engage an upper marginal length of said mandrel; means by which said lower sub and said lower nut abut one another and threadedly engage a lower marginal length of said mandrel;

said cylinder having an inner, longitudinally extending, elongated midportion which is greater in diameter than the opposed marginal ends thereof to thereby form an annular chamber of limited length between said mandrel and said cylinder; means forming a port in a midportion of said mandrel for communicating said annulus with the interior of said mandrel;

means forming an outlet port in said upper sub through which fluid can flow from the interior of the mandrel; said connecting rod being affixed to said upper sub; said valve means including a traveling valve means affixed to said lower sub for enabling produced fluid to travel into said mandrel on the downstroke of the pump assembly;

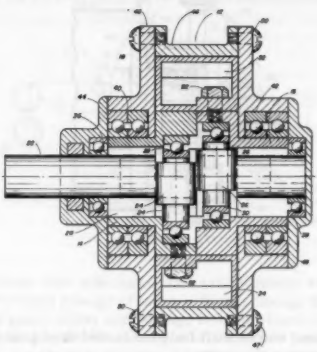
whereby fluid pressure effected within said mandrel is also effected within said annular chamber for causing the resilient cylinder to expand radially outward into sealing engagement with the interior of the barrel when the plunger lifts fluid on the upstroke.

3,953,156

ROTARY ENGINE

Thomas A. Smith, Rte. 2, Purvis, Miss. 39475

Filed Sept. 25, 1974, Ser. No. 509,157
Int. Cl.² F04C 1/00
U.S. Cl. 418—35 5 Claims



1. A rotary engine having an annular cylinder, hollow shafts supported for independent rotation concentric with said cylinder, and at least two pistons adapted to rotate within said cylinder, each said piston fixed to a respective shaft, said engine comprising:

a. An eccentric drive shaft mounted in said engine and passing through said concentric hollow shafts, said eccentric shaft having oppositely disposed ends extending beyond the ends of said concentric shafts and supported for rotation around its eccentric axis by its ends outboard of the concentric shafts' ends, and defining diametrically parallel holes that are oppositely offset from said eccentric axis and intermediate the rotational supports of both eccentric and concentric shafts;

b. Transverse members, having oppositely disposed ends, slidably mounted, respectively, in said parallel holes; and

c. Bearing means eccentrically fixed to and between oppositely disposed ends of said transverse members and their respective concentric shafts to slidably engage said members and shafts for transmitting the rotation of pistons and concentric shafts to said eccentric drive shaft.

3,953,157

ROTARY-PISTON INTERNAL-COMBUSTION ENGINE WITH TWO OUTPUT SHAFTS

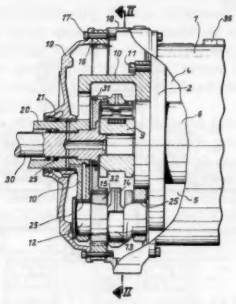
Huschang Sabet, Eduard-Pfeiffer Str. 67, D-7000 Stuttgart, Germany

Filed May 28, 1975, Ser. No. 581,704
Int. Cl.² F01C 1/00
U.S. Cl. 418—36 6 Claims

1. In a rotary-piston, internal-combustion engine having a casing, two sets of pistons mounted for rotation about a common axis while in movable sealing engagement with said casing so as to define chambers therebetween, motion-transmitting means connecting the pistons of one set to the pistons of the other set for rotating the pistons of said other set at cyclically varying speed when the pistons of said one set rotate at uniform speed and for thereby cyclically expanding and contracting said chambers, and a first output shaft connected to said one set for simultaneous rotation, said motion-transmitting means including a crank drivingly connected to said output shaft and a connecting rod hingedly connecting said crank to said other set, the improvement which comprises:

a. an epicyclic gear train including a first gear element fixedly fastened to said casing, a second gear element fastened to said crank and rotatably secured to said first

output shaft, and a third gear element, said second gear element simultaneously meshing with said first and third gear elements; and



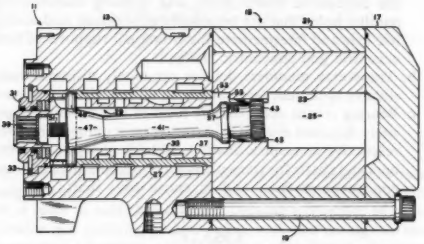
b. a second output shaft fastened to said third gear element for rotation therewith.

3,953,158

AXIAL RETENTION OF DRIVE SHAFT IN A FLUID PRESSURE DEVICE

Sohan Uppal, Hopkins, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Nov. 19, 1974, Ser. No. 525,255
Int. Cl.² F16C 1/02
U.S. Cl. 418—61 B 6 Claims



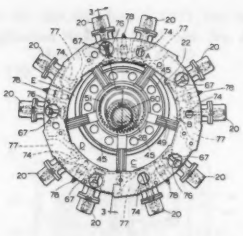
1. A fluid pressure device of the type including a housing, valve means disposed within said housing, an internally-toothed member fixed with respect to said housing, an externally-toothed member eccentrically disposed within said internally-toothed member for relative orbital and rotational movement and defining a longitudinal axis, said externally-toothed member defining a central bore, and first and second oppositely disposed end surfaces, a drive shaft disposed generally adjacent said first end surface and including a first shaft portion extending into said central bore, means connecting said first shaft portion and said externally-toothed member for common rotational and orbital movement, said externally-toothed member defining a first stop surface adjacent said first end surface and disposed generally perpendicular to said longitudinal axis and radially outward from said central bore, said first shaft portion including a shoulder portion extending radially outward therefrom, said first stop surface and said shoulder portion being in engagement during said rotational and orbital movement, to move at substantially the same speed, limiting axial movement of said drive shaft into said central bore.

3,953,159

INTERNAL COMBUSTION ENGINE

Lee Hunter, 13501 Ladue Road, Ladue, Mo.

Filed Jan. 20, 1975, Ser. No. 542,126
Int. Cl.² F02B 53/00; F04C 17/02
U.S. Cl. 418—61 R 4 Claims



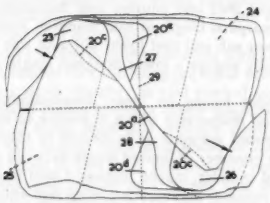
1. In an internal combustion engine the combination of frame means forming an annular combustion chamber, piston means in said chamber, sealing vanes carried by said piston means to engage with said chamber and form distinct combustion cells therein, a crankshaft extending axially through said chamber and rotatively mounted in said frame means, an eccentric fixed on said crankshaft and operatively engaged with said piston means, said piston means driving said crankshaft and moving relative to said chamber, and piston motion control means responsive to crankshaft rotation for holding the relative motion of said piston means to an orbital path in said chamber, said piston motion control means consisting of a first element on said piston, a second element on said crankshaft, and interengaged means operative between said first and second elements to nullify the tendency of said piston to rotate in the direction of crankshaft rotation and thereby generate the orbital motion of said piston means.

3,953,160

GEAR PUMPS AND MOTORS

Harry Simister Bottoms, Solihull, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed Mar. 12, 1974, Ser. No. 450,483
Claims priority, application United Kingdom, Mar. 15, 1973, 12545/73
Int. Cl.² F04C 1/04, 15/00
U.S. Cl. 418—190 3 Claims



1. A gear pump or motor comprising a housing having therein an eight-shaped chamber with ports communicating with the chamber on opposite sides thereof, a pair of meshed pinion elements running in said eight-shaped chamber, and a shaft connected to one of the said pinion elements and projecting from the housing, each pinion element being supported in bearing blocks with non-planar surfaces forming relieved zones, each pinion element having a plurality of teeth each of which has a working flank, which engages the working flanks of teeth on the other pinion, and a non-working flank, each

axial end portion of the non-working flank of each tooth of each pinion having a respective relieved portion adjacent its root, which relieved portion extends to the respective axial end of the non-working flank, and a further relieved portion adjacent its tip, which relieved portion extends to the respective axial end of the non-working flank, each non-working flank having an unrelieved land extending across the entire width, from the root to the tip, of the non-working flank intermediate the ends thereof, and wherein the ports in the housing communicate with the inter-tooth spaces via the relieved zones in the bearing blocks and the relieved portions of the non-working flanks of the teeth at axial ends thereof.

3,953,161

APPARATUS FOR MANUFACTURING SYNTHETIC TOW FOR STRETCH-CUT SPINNING PROCESS

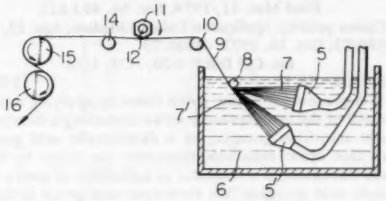
Noboru Oguchi; Takashi Hiramatsu; Ikuo Igami, all of Nagoya; Akira Aoki, Inazawa; Syogo Tanaka, Otake; Toshiro Seki, Otake, and Takao Inoue, Otake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Division of Ser. No. 277,990, Aug. 4, 1972, abandoned. This application Oct. 29, 1974, Ser. No. 518,973

Int. Cl.[2] D01D *5/16, 5/20*

U.S. Cl. 425—66 **1 Claim**

1. An apparatus for continuously producing a synthetic filament's tow from a plurality of synthetic filaments, comprising a pair of guide rollers for leading said filaments from spinnerets to a transfer roller for guiding said filaments to take-up means, a guide disposed at a position where coagulation of said filaments has not been completed, a deviation bar rotatably mounted on an axis transversal to said filaments and disposed just before or after a particular position on a passage defined by said pair of guide rollers where the coagulation of said filaments are completed, said deviation bar provided with a plurality of transversal radially projected polygonal edges in



connection with said transversal axis, whereby each of said edges deviates passage of said tow from a passage defined only by said guide rollers said passage being deviated according to rotational contact of said edges with said tow, said deviation bar provided with a plurality of blades extended radially from said transversal axis, and each of said edges of said deviation bar being arranged helically to said transversal axis.

3,953,162

DYEING PROCESS

Colin William Greenhalgh; David Francis Newton; Dennis Eckersley; Ian Cheetham; Duncan Adrian Sidney Phillips; Kenneth Dunkerley; Gerald Williams, and Vibhas Chokshi, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 21, 1974, Ser. No. 453,632

Claims priority, application United Kingdom, Apr. 25, 1973, 19580/73; Oct. 16, 1973, 48080/73

Int. Cl.² D06P *1/20, 1/38, 3/10*

U.S. Cl. 8—39 B **12 Claims**

1. A process for dyeing nylon fibers by applying thereto a dyestuff of the anthraquinone series containing a dicarboxylic cyclic anhydride grouping or a dicarboxylic acid grouping such that cyclic anhydride formation can occur by loss of water therefrom, or a half-ester or half-amide of such a dicarboxylic acid grouping, any carboxylic acid group in the said dyestuff being present in free acid form or in the form of a salt with ammonia or a volatile amine, said dicarboxylic grouping not being on the anthraquinone nucleus and being either in ortho position on a benzene ring attached to said anthraquinone nucleus or in anhydride-forming position or positioned with one carboxyl group on a carbocyclic aromatic ring attached to said anthraquinone nucleus and the other in anhydride-forming position therewith on an alkyl side chain, and heating the nylon fiber until fixation of the dyestuff takes place.

3,953,163

IMPROVEMENTS IN OR RELATING TO ORGANIC COMPOUNDS

Max May, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Mar. 3, 1975, Ser. No. 554,991

Claims priority, application Switzerland, Mar. 8, 1974, 3287/74

Int. Cl.² C14C *3/20*

U.S. Cl. 8—94.26 **17 Claims**

1. A tanning agent for leather, being the product of admixture of a zirconium or chromium salt and an aryl sulphone composition which composition is obtained by

a. sulphonation with sulphuric acid and at a temperature of from 80° to 150° C, a component (i) comprising at least one aromatic phenolic compound containing from 6 to 20 carbon atoms and having at least one hydroxyl group bound to a phenyl ring, and a component (ii) comprising at least one aromatic, non-phenolic compound containing from 6 to 20 carbon atoms, from 1 to 30% of component (i) and from 99 to 70% of component (ii), based on the total weight of components (i) and (ii), being employed, and removing water of sulphonation produced, and

b. condensing the resulting sulphonation product together with any unsulphonated components (i) and (ii), at a temperature of from 120° to 220°C, until the acid number of the mixture remains substantially constant.

3,953,164

EMBOSSING OF PILE FABRICS

Joseph Boba, Fort Lee, and Robert P. Conger, Park Ridge, both of N.J., assignors to Congoleum Industries, Inc., Kearny, N.J.

Filed Oct. 29, 1974, Ser. No. 518,245

Int. Cl.² B63H *9/04*

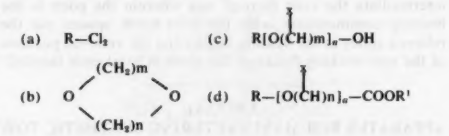
U.S. Cl. 8—115 **14 Claims**

1. Process for providing an embossed effect on nylon pile fabric having a surface of nylon fibers which comprises

applying to defined areas of the pile surface of said fabric a chemical embossing composition for said fibers containing an embossing agent and a penetrant therefor,

said embossing agent including an acid having a dissociation constant no stronger than that of maleic acid and said composition having a hydrogen ion concentration equivalent to a pH of no more than 4;

said penetrant corresponding to a compound selected from:



wherein each of *m*, *n*, and *a* is an integer from 1 to 4, inclusive, X=H or CH_3 and each R and R^1 is a lower alkayl radical of 1 to 5 carbon atoms

allowing said embossing composition to remain in contact with said fibers for a period of time and at a temperature sufficient to reduce the height of said pile only in the area contacted by said embossing composition, without deterioration of said fibers, said reduction being sufficient to display a significant embossed effect in the overall fabric.

3,953,165

FLAMEPROOFING RESINS FOR ORGANIC TEXTILES FROM ADDUCT POLYMERS

Armand B. Pepperman, Jr., Metairie; Donald J. Daigle, New Orleans, and Sidney L. Vail, River Ridge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 22, 1974, Ser. No. 499,803

Int. Cl.² D06M *13/28, 13/44*; **C09K** *3/28*

U.S. Cl. 8—116 P **4 Claims**

1. A process for flameproofing organic textiles, comprising:

a. reacting a hydroxymethyl phosphonium compound with ammonia or an amine to form an insoluble adduct polymer;

b. mixing said polymer with a formaldehyde solution and a hydroxymethyl phosphonium compound at a mole ratio of formaldehyde to polymer phosphorus of from 1:4 to 4:1 and at a mole ratio of phosphonium compound to polymer phosphorus of from 1:10 to 2:1, thereby dissolving said polymer; and

c. reacting in contact with an organic textile said dissolved polymer and a nitrogenous compound containing at least two members of the group consisting of hydrogen atoms or methylol radicals attached to a trivalent atom.

3,953,166

FLAME RESISTANT ORGANIC TEXTILES THROUGH TREATMENT WITH PHENOLS AND ADDUCT POLYMERS

Armand B. Pepperman, Jr., Metairie; Donald J. Daigle, New Orleans, and Sidney L. Vail, River Ridge, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 22, 1974, Ser. No. 499,804

Int. Cl.² C08G *33/16*

U.S. Cl. 8—116 P **2 Claims**

1. A process for flameproofing organic textiles comprising:

a. reacting a hydroxymethyl phosphorus compound with a nitrogenous compound to form an insoluble polymeric precipitate,

b. dissolving the precipitate from (a) in the presence of formaldehyde and an inorganic or organic acid with a mole ratio of 1:4 to 4:1 of formaldehyde to phosphorus contained in the precipitate and a 1:10 to 2:1 ratio of acid to phosphorus contained in the precipitate,

c. reacting the soluble polymer adduct from (b) with a phenolic type compound containing one or more hydrogens ortho or para to the phenolic hydroxyl group,
d. wetting a textile fabric with a solution of (c), and
e. drying the wetting fabric from (d) at a temperature from about 90°–170°C.

3,953,167
PROCESS FOR DYEING FIBERS OR FABRICS OF AROMATIC POLYAMIDES

Norihiro Minemura, and Setsuo Yamada, both of Takatsuki, Japan, assignors to Teijin Ltd., Osaka, Japan

Filed July 16, 1974, Ser. No. 488,918
Claims priority, application Japan, July 24, 1973, 48-82676
Int. Cl.² D06P *5/04*
U.S. Cl. 8—175 **8 Claims**

1. A process for dyeing aromatic polyamide fibers or fabrics, which comprises impregnating aromatic polyamide fibers or fabrics with (a) a cationic dye, (b) an aliphatic hydroxy compound having a boiling point of at least 180°C., (c) at least one swelling agent selected from the group consisting of o-phenylphenol, p-phenylphenol, benzophenone, β-naphthol and α-naphthol and (d) at least one of alkali metal salts or ammonium salts of inorganic or organic acids, the amount of said salt (d) being 1 to 10% by weight based on the sum total of the amounts of the dye (a), the hydroxy compound (b), the swelling agent (c) and the salt (d); and then heat-treating said fibers or fabrics with steam.

3,953,168
DYEING PROCESS

Sergio Fabbri, Basel, and Josef Frauenknecht, Therwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Filed July 15, 1974, Ser. No. 488,636
Claims priority, application Switzerland, July 20, 1973, 10645/73; Feb. 20, 1974, 2342/74
Int. Cl.² D06P *3/24*
U.S. Cl. 8—178 R **19 Claims**

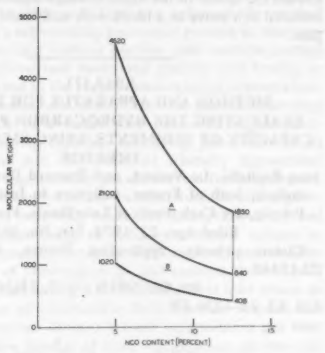
1. A process for dyeing or printing a voluminous textile substrate comprising natural or synthetic polyamide fibers, which process comprises applying to the substrate an aqueous dyeing or printing medium containing 0.05 to 100 g/l of a foaming agent selected from the group consisting of anionic, cationic, non-ionic and amphoteric foaming agents, forming a foam on said substrate, rolling up the substrate and rotating the rolled up substrate for a period of from 1 to 48 hours at a temperature of from 20° to 60°C. to effect fixation.

3,953,169
PAPERBOARD IMPREGNATED WITH POLYURETHANE RESIN

Selichi Igarashi, Suita; Kin-ichi Shirakawa, Ibaraki; Kazuo Kimura, Kobe, and Akira Ogino, Shinsenri-Higashi, all of Japan, assignors to Takeda Chemical Ind., Ltd., Japan

Continuation of Ser. No. 852,750, Aug. 25, 1969, abandoned. This application Sept. 5, 1974, Ser. No. 503,514
Claims priority, application Japan, Aug. 27, 1968, 43-61321
Int. Cl.² D06M *13/34;* **D21H** *1/40*
U.S. Cl. 8—192 **5 Claims**

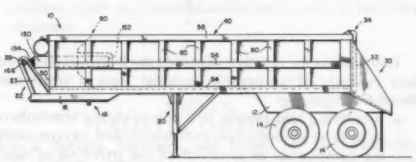
1. A paperboard impregnated with 0.05 to 5.0 weight percent of a polyurethane resin relative to the weight of the paperboard, said polyurethane resin being impregnated as a solution in an organic solvent therefor, said polyurethane resin being a polyisocyanate wherein the correlation between the NCO content and molecular weight is defined by area A in the Figure, said polyisocyanate being obtained by:
reacting tolylene diisocyanate with a polyether polyol produced by reacting an alkylene oxide with a diol having a low molecular weight, triol having a low molecular weight, tetraol or a mixture of any of the said polyether polyols with a polyalkylene glycol.



3,953,170
DUMP TRUCK WITH EJECTOR BLADE

James O. Webb, New Castle, Ind., assignor to Golay & Co., Inc., Cambridge City, Ind.

Continuation-in-part of Ser. No. 355,426, April 30, 1973, abandoned. This application Oct. 25, 1974, Ser. No. 518,080
Int. Cl.² B60P *3/00*
U.S. Cl. 214—82 **3 Claims**



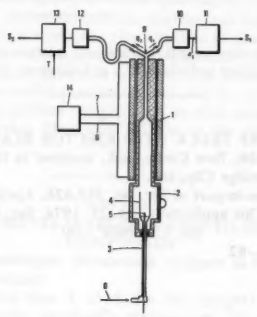
1. A vehicle for hauling material such as sand, gravel, asphalt mix, sludge, and the like comprising a mobile receptable provided by a bottom having longitudinally extending sides, a rear end, and a forward end, upwardly extending side walls attached, respectively, to said sides, and an end gate adjacent said rear end, said receptacle having an open top, a pusher blade in said receptacle to extend generally from side to side, means for mounting said blade for longitudinal movement between a first position adjacent said forward end and a second position adjacent said rear end, and motor means for longitudinally moving said blade to move such material out said end gate, said blade having a generally rectangular central body portion extending laterally and vertically and facing said rear end, said central body portion having a height not less than one-third the total height of said blade and not more than one-half the total height of said blade, a laterally extending rigid lower portion inclining downwardly and rearwardly from said central body portion to said bottom to exert forces upwardly on the material, a laterally extending rigid upper portion inclining upwardly and rearwardly from said central body portion to exert forces downwardly on the material, and vertically extending rigid side portions inclining outwardly and rearwardly from the opposite sides of said central body portion to said side walls to exert forces inwardly on the material, said side portions inclining outwardly and rearwardly at substantially the same angle, and said upper portion inclining upwardly and rearwardly at substantially the same angle as said lower portion inclines downwardly and rearwardly and

said upper portion and lower portion being substantially equal in height, so that, when the blade is moved rearwardly, the forces exerted on the material by the blade are centralized toward the center of the blade to reach equilibrium so that the material can move as a block with said blade toward said end gate.

3,953,171
METHOD AND APPARATUS FOR RAPIDLY EVALUATING THE HYDROCARBON PRODUCTION CAPACITY OF SEDIMENTS, USING SMALL SAMPLES THEREOF

Jean Espitalie, Le Vesinet, and Bernard Durand, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Filed Apr. 22, 1974, Ser. No. 463,185
Claims priority, application France, Apr. 27, 1973, 73.15348
Int. Cl.² G01N *31/12, 33/24*
U.S. Cl. 23—230 EP **31 Claims**



1. A process for rapidly evaluating the hydrocarbon production capacity of an organic material from a small sample thereof comprising:

a. pyrolyzing said sample in a non-oxidizing atmosphere so as to form hydrocarbon compounds and oxygen-containing compounds as products of the pyrolysis of said organic material;

b. producing a group of two signals S_1 and S_2, the value of signal S_1 being proportional to the quantity of at least one hydrocarbon compound other than the hydrocarbon compounds originally present in said organic material, said at least one hydrocarbon compound being produced by the pyrolysis of said organic material, the value of signal S_2 being proportional to the quantity of at least one of the oxygen-containing compounds produced by the pyrolysis of said organic material; and

c. evaluating from the values of said two signals the capacity of the sediment to constitute a good source for hydrocarbons.

3,953,172
METHOD AND APPARATUS FOR ASSAYING LIQUID MATERIALS

Stephen I. Shapiro, Scarsdale, N.Y., and Gerhard Ertingshausen, Cliffside Park, N.J., assignors to Union Carbide Corporation, New York, N.Y.

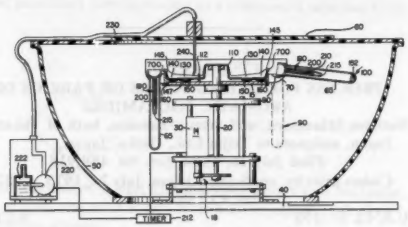
Filed May 10, 1974, Ser. No. 468,649
Int. Cl.² G01N *33/16, 31/08, 23/12*
U.S. Cl. 23—230 R **31 Claims**

1. A method for assaying a plurality of liquid samples which comprises

i. reacting at least two liquid materials in a plurality of cavities to provide a liquid containing at least one reaction product

ii. providing liquid phase separating means in communication with said cavities

iii. subjecting said cavities and said liquid phase separating means to centrifugal force sufficient to transfer the liquid



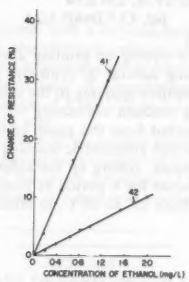
contents of said cavities to said communicating liquid phase separating means and provide separation of the liquid transferred thereto into at least two phases, and

iv. measuring at least one property of a separated phase.

3,953,173
GAS-SENSOR ELEMENT AND METHOD FOR DETECTING OXIDIZABLE GAS

Hidehito Obayashi; Tetsuo Gejyo, and Tetsuichi Kudo, all of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed July 5, 1973, Ser. No. 376,717
Claims priority, application Japan, July 8, 1972, 47-68309; Apr. 27, 1973, 48-47302
Int. Cl.² G01N *27/04;* **H01C** *13/00*
U.S. Cl. 23—232 E **38 Claims**

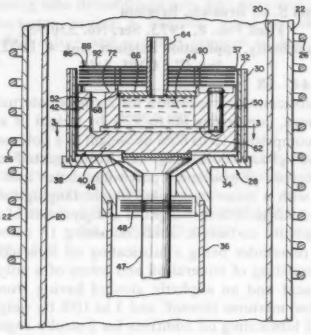


1. In a method for detecting the presence of a gaseous substance in a test gas comprising contacting the test gas with a sensor element whose resistance changes in the presence of said gaseous substance and measuring the resistance of said sensing element while said test gas is in contact therewith, the improvement wherein said gaseous substance is an oxidizable gas and further wherein said sensing element comprises a complex metal oxide having a perovskite-type crystal structure and represented by the general formula $A_{2-x}A'_xBO_{4-\delta}$, wherein A is at least one element selected from the group consisting of rare earth elements of the atomic numbers from 57 to 71, yttrium, and hafnium, A′ is at least one alkaline earth metal, B is at least one element selected from the group consisting of transition metals of the atomic numbers from 21 to 30, O is oxygen, x is in the range of $0 \leq x \leq 2$, and δ is a nonstoichiometric parameter.

3,953,174
APPARATUS FOR GROWING CRYSTALLINE BODIES FROM THE MELT

Harold E. LaBelle, Jr., Hanover, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

Filed Mar. 17, 1975, Ser. No. 558,768
Int. Cl.² B01J 17/18
U.S. Cl. 23—273 SP 6 Claims

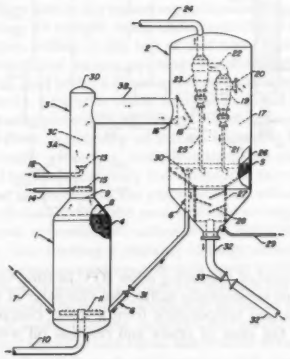


1. Apparatus for use in a system for growing crystalline bodies from the melt comprising: a crucible having a side wall and a bottom wall defining an interior space for containing a melt, said side wall having an upper end surface, a plurality of cavities in said side wall extending down from said upper end surface for receiving a like plurality of dies with capillaries, and at least one passageway in said side wall connecting the bottom ends of said cavities with said interior space so that melt can flow from said interior space into said cavities.

3,953,175
REGENERATION APPARATUS

Richard P. Pulak, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Dec. 28, 1973, Ser. No. 429,422
Int. Cl.² B01J 8/08, 8/18, 37/14
U.S. Cl. 23—288 B 8 Claims



1. An apparatus for oxidizing coke on spent catalyst which comprises in combination:

a. a spent-catalyst receiving chamber for containing a dense-phase fluidized bed of catalyst having a spent catalyst inlet means and a fresh-regeneration gas inlet means connected thereto to allow passage of spent catalyst and fresh regeneration gas respectively into said chamber and having a regenerated-catalyst/regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and regeneration gas from said chamber;

b. a transfer conduit positioned above said spent-catalyst receiving chamber and having a substantially vertical portion and a substantially horizontal portion in interconnection with said vertical portion, said vertical portion extending above said horizontal portion and having an inlet connected to the regenerated-catalyst/regeneration-gas outlet means and said horizontal portion extending into the side of a hereinafter described regenerated-catalyst receiving chamber and being provided with an outlet means into said chamber whereby regenerated catalyst and regeneration gas are carried from said spent-catalyst receiving chamber in admixture to said regenerated-catalyst receiving chamber, said portions of said transfer conduit being of sufficient internal volume to permit substantially complete CO oxidation and transfer of the heat of combustion to said catalyst therein, said transfer conduit having a combustible fluid inlet means to allow passage of combustible fluid into said conduit and having connected thereto a fresh regeneration gas inlet means to allow passage of fresh regeneration gas into said conduit;

c. a regenerated-catalyst receiving chamber for containing a dense-phase bed of regenerated catalyst, said chamber having a regenerated-catalyst outlet means and a spent-regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and spent regeneration gas from said chamber and said chamber being positioned adjacent to and at an elevation above said spent-catalyst receiving chamber sufficient to maintain at least a portion of said dense-phase bed of regenerated catalyst above said dense-phase fluidized bed of catalyst in said spent-catalyst receiving chamber; and,

d. a regenerated-catalyst recycle means to allow passage of regenerated catalyst directly from the regenerated-catalyst receiving chamber to the spent-catalyst receiving chamber.

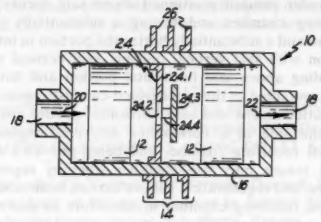
3,953,176
CATALYTIC CONVERTER

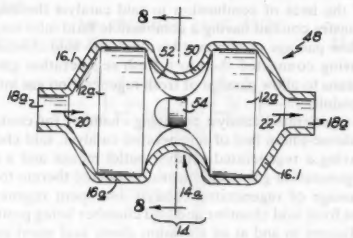
Teuvo J. Santala, Attleboro, and Ernest M. Jost, Plainville, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 22, 1973, Ser. No. 362,728
Int. Cl.² F01N 3/15
U.S. Cl. 23—288 FC 8 Claims

1. A device for catalytically converting automotive exhaust gas pollutants to harmless substances comprising a container having an inlet and an outlet at opposite ends of said container, a plurality of pairs of strips of metal catalyst material, each strip having a plurality of corrugations therein extending obliquely across the longitudinal axes of said strips, each pair of said corrugated strip materials being wrapped together in a jelly roll configuration to form a generally cylindrical catalyst unit, whereby said plurality of pairs of said strips form a plurality of said cylindrical catalyst units, said paired strip materials having the corrugations thereof obliquely disposed relative to each other so that said corrugations define obliquely intersecting passage portions which cooperate to define a multiplicity of passages of continuously varying cross-sectional area extending from end to end through each of said cylindrical catalyst units, said plurality of catalyst units being disposed in spaced sequential relation to each other within said container with the cylindrical axes of the cylindrical catalyst units extending in the direction between the inlet and outlet of said container for permitting automotive exhaust gasses to pass through said catalyst units in sequence to catalytically convert pollutants in the gasses to harmless substances, said catalyst units each having a selected cylinder length for limiting heat buildup in said gasses passing through said catalyst unit as a

result of exothermic catalytic reactions in said gasses, and heat dissipating means disposed within said container between said





catalyst units for reducing the temperature of said gasses passing between said catalyst units.

3,953,177

CERMET MATERIALS WITH METAL FREE SURFACE ZONES

Karl Sedlatschek, Reutte, and Friedrich Heitzinger, Lechaschau, both of Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.

Continuation of Ser. No. 218,583, Jan. 17, 1972, abandoned. This application Jan. 9, 1974, Ser. No. 431,976
Claims priority, application Austria, Jan. 20, 1971, 470/69
Int. Cl.² B22F 7/00
U.S. Cl. 29—182.2 **9 Claims**

1. A cermet material which consists essentially of a ceramic and a metal, said ceramic being selected from the group consisting of the oxides of aluminum, thorium, beryllium, titanium, zirconium, hafnium, magnesium, calcium, chromium, cerium, silicon and mixtures thereof, said cermet material having a surface zone that consists essentially of a ceramic skeleton in which said surface zone has been strengthened by the infiltration of a non-metallic component.

3,953,178

COATED METAL PRODUCT

Niels N. Engel, 720 Gonzales Road, Santa Fe, N. Mex. 87501

Division of Ser. No. 279,244, Aug. 9, 1972, Pat. No. 3,915,757. This application June 21, 1974, Ser. No. 481,486
Int. Cl.² B32B 15/04
U.S. Cl. 29—195 **6 Claims**

1. A coated metal product comprising, a steel martensitic substrate, a metal selected from the group consisting of: scandium, titanium, zirconium, hafnium, vanadium, columbium, tantalum, chromium, molybdenum, tungsten, lanthanum, cesium, praseodymium, neodymium, promethium, samarium europium, gadolinium, terbium, holmium, dysprosium, erbium, thulium, yttrium, ytterbium, lutetium, actinium, thorium, protactinium, uranium, neptunium, plutonium, americium, curium, berkelium, californium, einsteinium, fermium, mendelevium, nobelium, lawrencium, iron, cobalt, nickel and boron imbedded by ion bombardment into the surface area of said steel substrate, and a metal salt selected from the group consisting of a carbide, boride and nitride of said selected metal, bonded to the outer surface of said selected metal.

3,953,179

LUBRICATING COMPOSITIONS

Georges Jules Souillard, and Frederic Francois Van Quaethoven, both of Wezembeek, Oppem, Belgium, assignors to Labofina S.A., Brussels, Belgium

Filed Feb. 8, 1973, Ser. No. 330,757
Claims priority, application Belgium, Apr. 4, 1972, 115915
Int. Cl.² C10L 1/10
U.S. Cl. 44—58 **5 Claims**

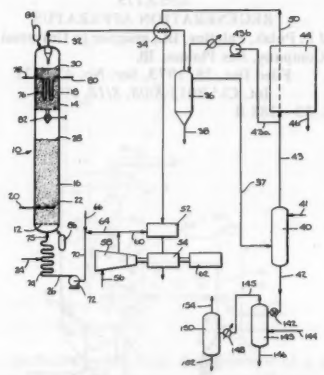
1. A lubricating composition for 2-stroke internal combustion engines, comprising 90 to 97% by weight of a lubricant mixture comprising 15 to 80% by weight of a polymer selected from the group consisting of hydrogenated and non-hydrogenated polybutene, polyisobutylene and mixtures thereof, with a mean molecular weight ranging from 250 to 2000, and 0.5 to 10% by weight of a triglyceride of an unsaturated aliphatic carboxylic acid containing 18 carbon atoms, and the remainder being a lubricating oil selected from the group consisting of mineral oil and esters of a polybasic carboxylic acid and an aliphatic alcohol having from 8 to 20 carbon and mixtures thereof, and 3 to 10% by weight of conventional lubricating oil additives for 2-stroke engines.

3,953,180

PRODUCTION OF LOW BTU SULFUR-FREE GAS FROM RESIDUAL OIL

Franklin D. Hoffert, Mountainside, and Harold H. Stotler, Westfield, both of N.J., assignors to Hydrocarbon Research, Inc., Morristown, N.J.

Filed July 11, 1974, Ser. No. 487,718
Int. Cl.² C10G 13/30
U.S. Cl. 48—215 **12 Claims**

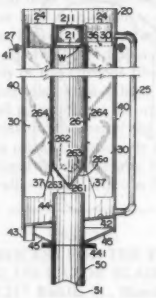


1. The method of producing a low BTU heating value combustible gas of substantially sulfur free character at relatively high pressure and temperature from a sulfur containing low grade oil of the class of crude and residual oil which comprises:

a. injecting said oil, steam, and air into a first bed of inert particulate matter under conditions to establish fluidization of the particulate matter and under a hydrogen partial pressure such that the oil is gasified and the bulk of the sulfur is converted to hydrogen sulfide with minimal amounts of carbonyl sulfide, the temperature in the bed being in the order of 1600°–2000°F., and the pressure being in the range of 200 to 400 psig;

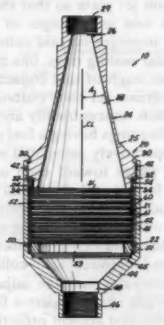
b. passing the resulting gases and vapors upwardly through a second bed of inert particulate matter in indirect heat exchanger with a cooling material to reduce the bed temperature to a range of 500° to 1000° F. to accomplish a concentration of ultra fine solid contaminants;
c. removing said concentrated solid contaminants;
d. cooling and desulfurizing the effluent gases from the second bed; and
e. reheating said desulfurized gas, said reheated gas being product gas having a calorific value of under 350 BTU/SCF/(dry) and a sulfur content of less than 0.3 wt.%.

3,953,181
FILTER DEVICE
Chin Kuo Chung, No. 4, An Tung Road, and Hsing Shang Chen, No. 29, Kuang Fu St., Tung Ning Road, both of Chu Tung Hsin Chu Hsien, China /Taiwan
Filed June 24, 1974, Ser. No. 482,616
Int. Cl.² B01D 47/00
U.S. Cl. 55—228 **9 Claims**



1. A filter device for removing pollutants from polluted gas, comprising: an upright, open-ended cylindrical body, a liquid distribution means on the top of said body closing the upper end thereof and having openings therethrough for flow of liquid into said body; a draining chamber at a bottom portion of said body; a cylinder inside said body coaxial therewith and spaced radially inwardly therefrom defining an annular space therebetween; a plurality of circumferentially spaced apart, longitudinally extending, radially corrugated plate members arranged between said body and cylinder in the annular space; the corrugations of adjacent plate members offset axially from one another such that the peaks of one corrugated member are spaced opposite the valleys of an adjacent corrugated member, thus forming a plurality of longitudinally extending, serpentine passageways open at their upper and lower ends for upward flow of polluted gas into and through the passageways; a vent through the liquid distribution means at the upper end of each of said serpentine passageways; means for supplying a treatment liquid to said liquid distribution means for gravity flow of the liquid through said openings and along said corrugated plate members and thus downwardly through said serpentine passageways to form a liquid film covering the outer surface of said plate members, so that the upward rising polluted gases flowing through the passageways are contacted by the treatment liquid and pollutants are removed from the gas by said treatment liquid and washed out through said draining chamber, whereby a clear, filtered gas flows out of the vents at the upper ends of the passageways.

3,953,182
COLLECTION MEDIUM FOR AIR SAMPLER
Thomas P. Roth, 5025 Hillsboro Road, Apt. 9E, Nashville, Tenn. 32715
Filed Sept. 3, 1974, Ser. No. 502,732
Int. Cl.² B01D 53/30
U.S. Cl. 55—270 **6 Claims**



1. A sampling device comprising a casing having an upstream inlet and a downstream outlet for separating particles entrained in a gaseous medium from the gaseous medium as the gaseous medium with the particles entrained therein passes through the sampling device from its upstream end to its downstream end, said sampling device comprising:
a plate holer having a centerline and disposed between said upstream inlet and downstream outlet;
a jet plate assembly having an upstream end and a downstream end through which a gaseous medium with particles entrained therein passes, said jet plate assembly including a plurality of jet plates carried by said plate holder so that said jet plates are serially aligned on said centerline parallel to each other, each of said jet plates oriented generally normal to said centerline, said jet plates including a first jet plate at the upstream end of said jet plate assembly and a plurality of second jet plates downstream of said first jet plate, each of said jet plates defining an upstream surface and a downstream surface thereon generally parallel to each other and normal to said centerline, each of said jet plates defining a plurality of jet impaction passages therethrough arranged along paths concentric about said centerline, each of said jet impaction passages oriented generally parallel to said centerline and opening onto said upstream surface and said downstream surface of each of said jet plates, said jet impaction passages in each of said jet plates located different distances from said centerline than said jet impaction passages in said jet plate adjacent to and immediately upstream of each of said jet plates so that said jet passages in each of said jet plates are staggered with respect to the adjacent downstream jet plate and the gaseous medium passing through said jet impaction passages of each of said jet plates is directed toward said upstream surface between said jet impaction passages of the adjacent downstream jet plate, each of said jet plates having an outer periphery outboard of said jet impaction passages therethrough;
a plurality of resilient collection substrates, each of said substrates having a first prescribed thickness, one of said substrates carried by and in juxtaposition with said upstream surface of each of said second jet plates, each of said collection substrates defining a plurality of arcuate slots therethrough arranged along slot paths concentric about said centerline, each of said slots overlying a plurality of said jet impaction passages opening onto said upstream surface of each of said second jet plates carrying said collection substrate, each of said slots having op-

posed ends and a plurality of slots lying along each concentric slot path, said substrate defining a land between the ends of adjacent slots lying along the same slot path, said lands in each of said slot paths radially aligned with one of said lands in each of the other of said slot paths of said substrate, said substrate further defining an arcuate collection surface between said arcuate slots facing the adjacent upstream jet plate so that the gaseous medium passing through said jet passages of said adjacent upstream jet plate impinges on said collection surface,

a plurality of annular sealing rings, one of said sealing rings mounted between each of said collection substrates and the adjacent upstream jet plate outboard of said jet passages and said slots concentrically about said centerline, each of said sealing rings having a first prescribed height;

clamping means operatively associated with said casing for forcing said jet plates toward each other to cause said sealing rings to form a seal about and between the outer periphery of said jet plates and position said jet plates parallel to each other, a space having a second prescribed height greater than said first prescribed thickness of said substrates defined between said collection surfaces of each of said substrates and the adjacent upstream jet plate, said jet plates spaced apart a first prescribed distance greater than said second prescribed height of said space; and

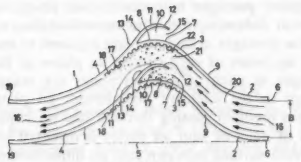
a plurality of locator-dividers, one of said locator-dividers positioned between each of said substrates and the adjacent upstream jet plate, and lying within said sealing rings, each of said locator-dividers including a plurality of crossbars, each of said cross bars radially extending from said centerline and having a third prescribed height greater than said second prescribed height of said space and less than said first prescribed distance between said plates, each of said cross bars engaging one of said substrates on said radially aligned lands between the ends of said slots so that said substrate is compressed thereby and the resiliency of said substrate causes said substrate to force said cross bars into sealing engagement with the downstream surface of the next upstream jet plate of said jet plates.

3,953,183

APPARATUS FOR SEPARATING MATERIAL PARTICLES FROM GASES

Ulrich Regehr, Susterfeld 65, 51-Aachen, Germany

Filed Sept. 25, 1973, Ser. No. 400,663
Claims priority, application Japan, Oct. 3, 1972, 47-99366
Int. Cl.² B01D *45/08*
U.S. Cl. 55—440 **11 Claims**



1. A separator of material particles from gases, comprising:

at least one gas duct with an upstream and a downstream orifice in the direction of flow;

said gas duct including two surfaces in a parallel alignment of alternatively convexly and concavely shaped walls of continuous waves;

the wave of each surface comprising at least three circular arcs, a first convex arc, a second concave arc, and a third convex arc, said arcs developed of radiuses of curvatures different from each other and interconnected to curve in opposing directions from each other to form gas passages in said duct of different areas, when measured on the cross-sections perpendicular to said wave surfaces;

the convex surface of each arc provided with a warped blade forking above its apex in the direction of the first arc into a fourth arc developed on a radius of curvature smaller than that of the second arc and projecting into the gas duct to define there together with the convex apex a first separating chamber open towards the flow of the gas;

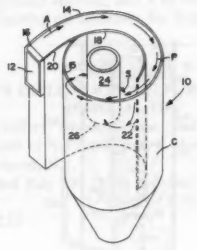
the concave surface of each second arc provided with a plurality of serrations beneath said second arc and projecting into said duct above said blade.

3,953,184

CYCLONE-TYPE DUST SEPARATOR

William F. Stockford, and Joseph M. Gamewell, both of P.O. Box 1430, Salisbury, N.C. 28144

Filed Sept. 18, 1974, Ser. No. 506,936
Int. Cl.² B01D *45/12*; B04C *5/04*
U.S. Cl. 55—458 **1 Claim**



1. A cyclonic dust separator of the type including a top wall, a conical shaped lower portion having a discharge opening at the lower end, an intermediate separation chamber joining the top wall and lower portion, and a discharge cylinder extending through said top wall and downwardly into said separation chamber, wherein the entering contaminated air stream is directed into a vortex and caused to turn at a turning point and exit through said discharge cylinder, said separation chamber comprising:

a. an outer wall extending for approximately one revolution in an arcuate path defined by a continuously decreasing radius to a trailing edge spaced from the initial portion of said outer wall;

b. an inner wall extending from said trailing edge inwardly into said chamber along an arcuate path spaced from said outer wall and defined by a continuously decreasing radius to a terminal edge defining a dust separation point;

c. an inlet opening between said outer wall and said trailing edge for directing an air path horizontally into said separation chamber between said outer and inner walls;

d. said continuously decreasing radius of said inner wall decreasing at a rate slower than the corresponding radius decrease of said outer wall, to define a converging air path which increases the velocity of said air stream;

e. said terminal edge of said inner wall being positioned approximately one-half revolution beyond said trailing edge; and

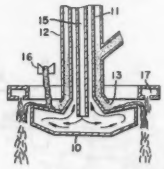
f. the inner wall being of substantially the same vertical dimension as said outer wall, the lower edge of said inner and outer walls extending to a level below the lower end of said discharge cylinder.

3,953,185

METHOD FOR MAKING VITREOUS FIBERS HAVING SMALL PROTRUSIONS

Susumu Aoki, Yokohama; Toshiaki Minaki, Yama; Kentaro Mori, Tokyo, and Kenichi Shibata, Nara, all of Japan, assignors to Nippon Asbestos Co., Ltd., Tokyo, Japan

Division of Ser. No. 427,113, Dec. 21, 1973. This application July 10, 1975, Ser. No. 594,867
Claims priority, application Japan, Dec. 25, 1972, 47-2204
Int. Cl.² C03B *37/04*
U.S. Cl. 65—8 7 Claims



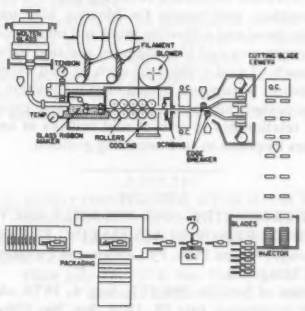
1. A process for making a length of inorganic vitreous fiber for use as a reinforcing element in the matrix of cementituous mixtures wherein said fiber is comprised of a body of a single vitreous fiber and at least one small protrusion formed integrally with said fiber body on the surface thereof comprising simultaneously but separately feeding molten inorganic material to form the body of the vitreous fiber and heat corrosion reistance mineral particles onto a high speed rotating rotor whereby the mineral particles are incorporated into the molten inorganic material and thereafter the incorporated molten inorganic material is released outwardly from the rotor due to the rotating centrifugal force, thereby fibrilating the molten material into a plurality of the vitreous fibers.

3,953,186

INDUSTRIAL PROCESS FOR THE PRODUCTION OF GLASS RAZOR BLADES

Robert E. Howey, 1217 Kukila St., Honolulu, Hawaii 96818

Filed Nov. 22, 1974, Ser. No. 526,375
Int. Cl.² C03B *21/00*
U.S. Cl. 65—51 2 Claims



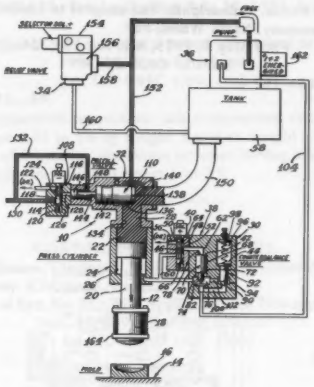
1. I claim a process for the production of glass razor blades comprising the steps of imbedding mesh into a portion of a layer of molten glass being extruded to form a thin ribbon of glass and in a position within the said ribbon such that other portions of the glass ribbon are free from the mesh, scribing and stress fracturing the ribbon in said other portion of the ribbon, and further cutting the ribbon in dimensions suitable to form glass razor blades.

3,953,187

CONTROL SYSTEM FOR HYDRAULIC RAMS

Richard L. James, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.

Continuation of Ser. No. 423,182, Dec. 10, 1973, abandoned. This application Mar. 19, 1975, Ser. No. 559,702
Int. Cl.² C03B *11/16*
U.S. Cl. 65—161 9 Claims



1. In a glass making machine having a mold and a ram movable into said mold for forming a glass product of the desired shape between said ram and said mold, an improved control system for operating said ram, said system comprising, in combination, an upright hydraulic cylinder, a hydraulic fluid supply positioned above said cylinder, a piston vertically and axially movable in said cylinder, said cylinder having upper and lower chambers defined on opposite sides of said piston, a feed line interconnecting said supply to said upper chamber of said cylinder, means for rigidly interconnecting said ram to said piston for simultaneous movement therebetween, first valve means for controlling the flow of hydraulic fluid to and from said upper chamber, second valve means for controlling the flow of hydraulic fluid to and from said lower chamber, means for operating both said first and second valve means, said operating means controlling said first valve means for directing pressurized fluid to said upper chamber and for also gravity feeding hydraulic fluid from said supply to said upper chamber for avoiding cavitation in said upper chamber when said ram is moving downwardly, said feed line being dimensionally sized to cooperate in maintaining said upper chamber substantially full of hydraulic fluid when said ram is moving downwardly, and means for controlling said second valve means for causing the flow of hydraulic fluid from said lower chamber for rapidly lowering said ram to said mold by said pressurized fluid in said upper chamber and by the substanatial free fall action of gravity acting on said ram, said piston, said connecting means and the hydraulic fluid in said upper chamber and without cavitation in said upper chamber, said hydraulic fluid filling said feed line without cavitation during said free fall action, said second valve means including means for venting said lower chamber to atmospheric pressure and said operating means also including means for controlling hydraulic fluid pressure and volume in both said upper and lower cylinder chambers for reducing the speed of said ram as said ram approaches said mold until a fixed pressing position and preselected pressing pressure are attained for forming glass between said mold and said ram, said controlling means including means for deactivating said venting means and causing said second valve means to create pressure in said lower chamber and also including means for operating first valve means for stopping the free flow of hydraulic fluid to said upper chamber while increasing the pressure level in said

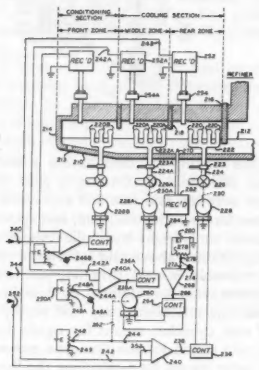
upper chamber to desired pressing pressure by said first valve means stopping free flow of hydraulic fluid from said supply tank to said upper chamber.

3,953,188

CONTROL SYSTEM FOR MOLD COOLING IN GLASS FORMING MACHINE

Harry A. Fertik, Philadelphia, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed May 5, 1975, Ser. No. 574,224
Int. Cl.² C03B 25/04
U.S. Cl. 65—162 6 Claims



1. In a control system for maintaining a constant temperature for the parisons formed in a glass forming machine supplied from a temperature controlled glass feeder where the parisons are subjected to air cooling by the blowing of air from a duct onto the mold for the parisons and where the control system includes means for varying the pressure of the cooling air in the duct, means for producing a pressure indicative signal, control means operable in response to changes in the pressure indicative signal to control said pressure by controlling the operation of said pressure varying means, said control being responsive to changes in the temperature of the cooling air so as to cause said control means to vary the pressure in said duct to maintain a substantially constant temperature for said parisons as the temperature of said cooling air changes; the improvement comprising,

means for comparing said pressure indicative signal with a limit value for said pressure, and

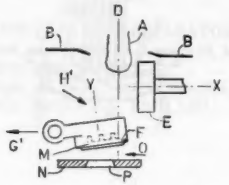
means operable when said pressure indicative signal exceeds said limit for modifying the heat transfer equilibrium between the air cooling system and the parisons so as to maintain the parison temperature at its desired value.

3,953,189

APPARATUS FOR SHEARING AND TRANSFERRING A GLASS CHARGE

Herman Buurman, and Hendrik Romberg, Eindhoven, both of Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.

Division of Ser. No. 403,099, Oct. 3, 1973, Pat. No. 3,868,240.
This application Aug. 23, 1974, Ser. No. 500,035
Claims priority, application Netherlands, Apr. 11, 1973, 7305030
Int. Cl.² C03B 5/30, 9/00
U.S. Cl. 65—207 7 Claims



1. Apparatus for producing formed hollow articles comprising:

means for producing a molten stream of glass;

a glass shear for severing a glass charge from said molten stream;

a blank shaping mechanism comprising two shaping cups, said shaping mechanism including first means for controlling said cups for intercepting and seizing said severed glass charge, said first means sequentially positioning said cups (1) on opposite sides of a plane extending through said stream and (2) on the same side of a said plane;

and means for blowing glass including a series of carriers, means for moving said carriers along a closed path, each of said carriers including a generally planar horizontal member being provided with an orifice, said carrier being movable in a second direction generally transverse to their direction of movement in said closed path, said second direction also being generally transverse to said plane during at least a part of said closed path, means for moving said carriers sequentially in said generally transverse direction between a receiving position and a blowing position, said means for blowing also including a blowing head and a blowing mold and means for periodically registering said blowing head and said blowing mold with each of said orifices of each of said carriers when said carrier is disposed in said blowing position, said first means periodically positioning one of said cups in registered relationship to one of said orifices in one of said carriers disposed in said receiving position.

3,953,190

PELLET PREHEATING AND VOLATILE RECYCLING STRUCTURE FOR GLASS MAKING FURNACE

Karl H. Lange, Allison Park, Pa., assignor to Pullman Incorporated, Chicago, Ill.

Continuation of Ser. No. 386,112, Aug. 6, 1973, abandoned.
This application July 28, 1975, Ser. No. 599,440
Int. Cl.² C03B 5/16
U.S. Cl. 65—335 4 Claims

1. A pellet preheater adapted to receive the exiting combustion gases from a glass furnace for heating pellets to be introduced to the glass furnace comprising

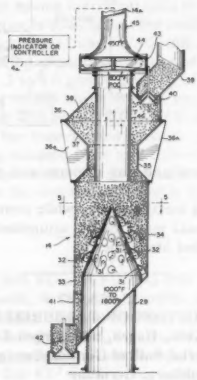
a tubular hot gas stack section adapted to being connected to receive the exiting combustion gases from the glass furnace,

a top portion of the hot gas stack section being apertured to allow the combustion gases to pass therethrough,

a cylindrical exhaust tube to carry gases out of the preheater, and

a pellet containing stack section receiving and holding the pellets while they are heated and coated by the condensate from the combustion gases, said pellet stack section surrounding the hot gas stack section and the exhaust tube and including a lower portion, above that a reduced portion and above that a top section,

the lower portion of the pellet stack section surrounding the top portion of the hot gas stack section and including a



discharge valve to allow discharge of the heated pellets from the preheater,

the top section of the pellet stack section surrounding the exhaust tube and including an intake valve to admit pellets to the preheater,

the reduced portion of the pellet stack section joining the top section and the lower portion of the pellet stack section and surrounding the exhaust tube, said reduced portion including an inwardly and downwardly slop'ng surface to heat the pellets by contact with the exhaust tube and the sloping surface of said reduced portion.

3,953,191

CUBED SOIL CONDITIONER WITH HIGH WATER ABSORPTIVITY AND RETENTIVITY

Benny M. Barton, Lubbock, Tex., assignor to HoBar, Inc., O'Donnell, Tex.

Filed July 25, 1974, Ser. No. 491,927

Int. Cl.² C05F *5/00*

U.S. Cl. 71—23 **9 Claims**

1. A process which comprises admixing with soil an amount effective to condition the soil of highly-compressed, dusted, ground and steamed cotton-gin-waste pellets.

6. Pelletized soil conditioner, each pellet of which comprises an admixture of a) ground and steamed cotton gin waste with b) at least one member selected from the group consisting of fertilizer and soil adjuvant, the soil conditioner being water absorptive, water retentive and virtually free from weed seeds and pathogens detrimental to woody or herbaceous dicotyledonous plants.

3,953,192

NON-CAKING HYDROXY-ALUMINUM POLYMER-COATED AMMONIUM SALT COMPOSITIONS

Clive Hodgson, Forest Knolls; George R. Hawkes, Concord; Marion G. Reed, Hacienda Heights, and William G. Toland, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 323,571, Jan. 15, 1973, Pat. No. 3,852,055. This application July 10, 1974, Ser. No. 487,066

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.² C05C *1/00, 1/02*

U.S. Cl. 71—59 **14 Claims**

1. A particulate ammonium salt composition coated with from about 0.01 to 5% by weight, based on weight total composition, of a hydroxy-aluminum polymer having a hydroxyl-to-aluminum mol ratio of about 1 to 2.9.

3,953,193

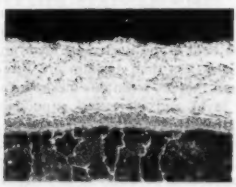
COATING POWDER MIXTURE

Irwin I. Bessen, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 353,764, April 23, 1973. This application Nov. 15, 1974, Ser. No. 524,327

Int. Cl.² B05D *1/08, 5/00*

U.S. Cl. 75—.5 R **5 Claims**



1. A powder mixture, particularly useful in a coating method for a surface based on an element selected from the group consisting of Fe, Co and Ni, the mixture consisting essentially of, by weight:

0.5 – 90% of a powder selected from the group consisting of Al; an alloy consisting essentially of, by weight, 50 – 70% Ti, 20 – 48% Al and 0.5 – 9% combined C; and alloys of Al and an element selected from the group consisting of Fe, Co and Ni;

0.5 – 4% Cr powder;

0.1 – 10% of a halide salt selected from the group consisting of NH_4F, NH_4Cl, NaF and KF;

with the balance Al_2O_3 powder.

3,953,194

PROCESS FOR RECLAIMING CEMENTED METAL CARBIDE

Albert G. Hartline, III, Albany, N.Y.; John A. Campbell, Auburn Heights, Mich., and Theodore T. Magel, Coraopolis, Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed June 20, 1975, Ser. No. 588,566

Int. Cl.² B22F *1/00, 1/04*

U.S. Cl. 75—.5 BC **19 Claims**

1. A process for reclaiming cemented metal carbide comprising

A. oxidizing said cemented metal carbide by subjecting it to oxygen at a temperature of at least 1100°F for a time sufficient to convert metal carbide to metal oxide,

B. subdividing the metal oxide to a powder,

C. reducing the metal oxide powder by subjecting it to a reducing gas at a temperature and for a time to reduce the oxygen content of the powder to a maximum of 0.5% by weight, and

D carburizing the reduced powder by subjecting it to available carbon at a temperature and for a time to convert said metal to metal carbide.

3,953,195

METHOD OF REFINING CARBON-UNSATURATED SYSTEM FERRO-CHROMIUM

Morio Harada, Takaoka; Saburo Kojima, Shinminato; Kazumi Ohta, Takaoka, and Hiroaki Shimomura, Shinminato, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 319,722, Dec. 29, 1972, abandoned. This application Sept. 9, 1974, Ser. No. 504,365

Int. Cl.² C21C *5/52*; C22C *33/04*

U.S. Cl. 75—12 **1 Claim**

1. In a process of manufacturing carbon unsaturated ferro-chromium employing an electric furnace having an electrode and a bottom, wherein is contained a molten metal layer comprising Fe, Cr, C, a slag layer comprising CaO, MgO, SiO_2 and Al_2O_3, a Bodenfest layer, and a mixing layer, and wherein is charged raw materials comprising chromium ores, reducing agent, silica and lime; the improvement comprising the combination of steps of

A. controlling the composition of the charging raw material prior to charging of same into said furnace so that the chromium ore has 20 to 50% of particles sizes less than 10 mm whereby the chromium ore particles 10 mm and above are held in the Bodenfest layer and the chromium ore particles less than 10 mm are fused in the molten metal layer, thereby to enable increased silicon content in the slag layer and increased impedance between said electrode and said bottom;

B. adjusting the SiO_2 content in the charging material charged into said furnace to maintain the content of SiO_2 in the slag layer at between 35 to 45%, thereby to prevent the Bodenfest layer from becoming molten and thereby enable the Bodenfest layer to effectively decarburize and desiliconize, and thereby to enable the slag layer to effectively desulphurize; and

C. controlling the electric current applied to the furnace such that the impedance between said electrode and said bottom is more than 1.6×10^{-3} ohms, thereby to prevent said molten layer from rising and interfering with the action of said slag layer and said Bodenfest layer and thereby improve heating efficiency of the furnace.

3,953,196

PROCESS FOR THE DIRECT REDUCTION OF METAL OXIDES

Richard F. Obenchain, 3340 Comanche Road, Pittsburgh, Pa. 15234

Filed Apr. 5, 1974, Ser. No. 458,096

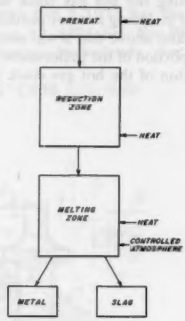
Int. Cl.² C21B *13/14*

U.S. Cl. 75—38 **12 Claims**

1. A process for the direct reduction of iron oxides comprising:

charging agglomerates of intimately mixed iron oxide, solid carbonaceous material and slag forming material into a shaft furnace, said agglomerates containing sufficient solid carbonaceous material to completely reduce said iron oxide, and raising the temperature of said agglomerates such that the iron oxide therein is reduced to metal by said carbonaceous material, which metal is encased within a slag protective shell formed by said slag forming material, but below the temperature at which said slag forming material liquifies to form integral reduced agglomerates of slag-encased metal;

further heating said integral reduced agglomerates under a controlled atmosphere, said atmosphere being controlled by varying the oxygen supplied to an oxygen-fuel flame, to the fusion temperature of the slag protective shell



whereby metal and slag disperse and can be separated; and

separating said metal and slag while controlling the cabon content of said metal below saturation by contact with said controlled atmosphere.

3,953,197

PRODUCTION OF CARBURIZED IRON

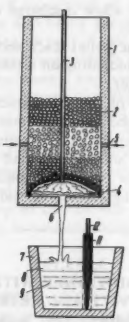
Hans Günther Geck, Hagen, and Jurgen Langhammer, Bremen-Platjenwerbe, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed May 23, 1974, Ser. No. 472,892

Claims priority, application Germany, May 25, 1973, 2326721

Int. Cl.² C21C *7/00*

U.S. Cl. 75—48 **4 Claims**



1. A process of producing carburized iron from particulate iron which forms a supernatant slag layer when melted which process comprises the following steps:

a. melting the particulate iron in a furnace;

b. transferring the molten iron from the melting furnace to a ladle,

c. bringing the molten iron in the ladle into contact with carbon that is fixedly located below the supernatant slag layer for a period of time sufficient to effect a preselected degree of carburization of the molten iron, and

d. thereafter withdrawing the thus carburized molten iron from the ladle.

3,953,198

METHOD FOR TREATING MOLTEN IRON USING A MAGNESIUM INFILTRATED METAL NETWORK

Jairaj Easwaran, Toledo, Ohio, and George S. Foerster, Hightstown, N.J., assignors to N L Industries, Inc., New York, N.Y.

Division of Ser. No. 454,951, March 26, 1974, Pat. No. 3,902,812, which is a continuation-in-part of Ser. No. 385,584, Aug. 3, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 536,967

Int. Cl.² C21C 7/00; C22C 33/08

U.S. Cl. 75—58 3 Claims

1. A process for treating molten iron which comprises immersing a porous ferrous metal network impregnated with magnesium into said molten iron to reduce the sulfur content thereof, said metal network comprising compressed ferrous scrap metal pieces having individual sizes in which the length of the pieces is from ⅛ to 9 inches, the width is from 1/64 to 1 inch and the thickness is from 1 to 100 mils, said compressed network before being impregnated with said magnesium having a density of 1.2 to 4.0 g/cc, a porosity of 50% to 85% and a short transverse tensile strength of at least 2 psi, said network impregnated with from 18% to 55% magnesium based on the weight of the impregnated network, said impregnated magnesium being released from said network in a rapid and orderly manner by maintaining the structural strength of said metal network as the magnesium metal is released from said metal network.

3,953,199

PROCESS FOR REFINING PIG IRON

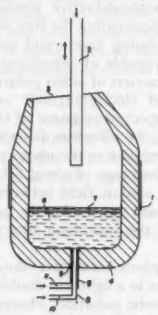
Eduard M. Michaelis, Seewalchen, Austria, assignor to Vereinigte Osterreichische Eisenund Stahlwerke, Vienna, Austria

Filed Feb. 11, 1974, Ser. No. 441,391

Claims priority, application Austria, Feb. 12, 1973, 1256/73

Int. Cl.² C21C 5/32, 5/34

U.S. Cl. 75—60 4 Claims



1. In a process for refining pig iron with technically pure oxygen within a converter wherein the oxygen is supplied to the bath simultaneously from above and from below the surface of the melt by impingement onto the bath surface by means of a lance and by means of at least one bottom nozzle below the surface of the bath, said nozzle providing an oxygen jet, said nozzle also providing hydrocarbons as a sheathing for said oxygen jet, the improvement comprising undertaking said refining by impinging oxygen onto the surface of the bath while adjusting the pressure of the oxygen supplied from below at the beginning of the refining process so that the pressure is adequate to prevent said pig iron from entering said nozzle; continuing said refining by impinging until the amount of carbon in the bath contents is between 0.2 and 0.05 percent by weight; and increasing the pressure of oxygen introduced from below when the amount of carbon in the bath content is between 0.2 and 0.05 percent by weight, thereby enhancing the turbulence and stirring action and the rate of refining action which decrease when the amount of carbon in the bath content falls to between 0.2 and 0.05 percent by weight.

3,953,200

NICKEL EXTRACTION PROCESS

Suk Joong Im, Southfield, Mich., and James D. Johnston, Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Mar. 27, 1975, Ser. No. 562,420

Int. Cl.² C22B 23/04

U.S. Cl. 75—103 10 Claims

1. A process for recovering an increased quantity of nickel values from a low-grade complex nickel ore said process comprising simultaneously grinding and leaching with an aqueous ammonia and ammonium salt solution of a comminuted low-grade nickel ore characterized by having a nickel content of not more than about 0.5 percent by weight and a sulfur to nickel ratio of one or less for a time sufficient to form a resultant aqueous solution of nickel values.

3,953,201

FERRITIC STAINLESS STEEL

John Randolph Wood, Valencia, and Roger N. Wright, Sarver, both of Pa., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Filed Mar. 7, 1974, Ser. No. 449,177

Int. Cl.² C22C 38/22, 38/28

U.S. Cl. 75—126 C 18 Claims

1. A ferritic stainless steel consisting essentially of, in weight percent, from 10.5 to 19% chromium, up to 0.03% carbon, up to 0.03% nitrogen, up to 0.20% manganese, up to 0.20% silicon, up to 0.30% nickel, up to 0.10% aluminum, up to 0.20% copper, at least one element from the group consisting of titanium and molybdenum in an amount of titanium of from 4 (%C + %N) to 0.75% and in an amount of molybdenum of from 0.50 to 2.50%, balance essentially iron; said titanium and molybdenum being present in respective amounts of less than 0.05 and 0.20% when said elements are residuals; said carbon, nitrogen, manganese, silicon, nickel, aluminum and copper, and titanium and molybdenum if residuals, being balanced in accordance with the following equation:

$$\%C + \%N + \%Mn + \%Si + \%Ni + \%Al + \%Cu + \%Ti, \text{ if residual} + \%Mo, \text{ if residual} \quad 0.75$$

3,953,202

PHOSPHORUS-BEARING MASTER COMPOSITION FOR ADDITION TO HYPER-EUTECTIC SILICON-ALUMINUM CASTING ALLOYS AND PROCESS THEREFOR

Robert T. C. Rasmussen, Pottstown, Pa., assignor to Kawecki Berylco Industries, Inc., Reading, Pa.

Filed Feb. 10, 1975, Ser. No. 548,278

Int. Cl.² C22C 21/00

U.S. Cl. 75—148 11 Claims

6. A process for refining the primary silicon grains of hypereutectic silicon-aluminum alloys, said process comprising adding to said alloy in molten form, a grain-refining amount of a master composition comprising a compacted intimate mixture of particles of ferrophosphorus and particles of aluminum metal.

3,953,203

JEWELRY ALLOYS

Mitchell W. Haller, Jr., York, Pa., assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Jan. 24, 1975, Ser. No. 543,751
Int. Cl.² C22C 19/05
U.S. Cl. 75—171 8 Claims

1. An alloy having utility for fabrication into jewelry consisting essentially by weight:

	Approximate Ranges
Tin	2 – 8%
Chromium	8 – 18%
Silicon	0 – 1%
Aluminum	0 – 3%
Niobium	0 – 10%
Nickel	Balance.

3,953,204

METHOD OF MAKING AN ANODE

Gehart P. Klein, Manchester, Mass., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Division of Ser. No. 196,328, Nov. 8, 1971, Pat. No. 3,809,552. This application Nov. 29, 1973, Ser. No. 420,140
Int. Cl.² B22F 1/00
U.S. Cl. 75—211 9 Claims

1. A method of making capacitor anodes comprising providing a mold having cavities therein which have been filled with a slurry of film-forming metal, moving headed or barbed ends of risers made of film-forming metal into the cavities, freezing slurry around ends of the risers while maintaining the ends in the cavities to form shaped masses, removing the shaped masses from the cavities, sintering the shaped masses at an elevated temperature to form rigid bodies, and forming a dielectric oxide over the rigid bodies.

3,953,205

PRODUCTION OF HOMOGENEOUS ALLOY ARTICLES FROM SUPERPLASTIC ALLOY PARTICLES

Arthur R. Cox, Jupiter, and Gary K. Lewis, Lake Park, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 6, 1973, Ser. No. 367,601
Int. Cl.² B22F 3/12
U.S. Cl. 75—213 6 Claims

1. A process for reproducibly forming homogeneous articles from the constitutionally complex alloys which comprises:

providing the alloys in the form of clean, cold-worked particulate material, with the degree of cold work in the particles being sufficient to cause recrystallization and a condition of superplasticity when the alloy is heated above its recrystallization temperature, the individual particles being substantially homogeneous in composition, having an effective particle size exceeding about 0.003 inch, and providing a density of at least about 15 percent of the theoretical alloy density;

prior to extensive compaction, outgassing the particulate material in vacuum at high temperature, removing substantially all adsorbed and occluded gases therefrom;

prior to extensive compaction, heating the particulate material to a temperature sufficient to cause recrystallization and a condition of superplasticity;

compacting the degasified superplastic particulate material in vacuum at a temperature sufficient to provide interparticle bonding and further compacting the material to provide a unitary article of full theoretical density; and

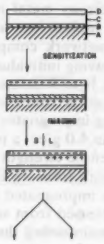
with the time at temperature prior to full compaction being confined to a duration less than that required for the formation, by an internal diffusion mechanism, of surface species on the particulate resistant to interparticle metallurgical bonding.

3,953,206

INDUCTION IMAGING METHOD UTILIZING AN IMAGING MEMBER WITH AN INSULATING LAYER OVER A PHOTOCONDUCTIVE LAYER

John W. Weigl, West Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 30, 1974, Ser. No. 465,457
Int. Cl.² G03G 13/10
U.S. Cl. 96—1 LY 29 Claims



1. In an electrostatographic imaging method wherein an imaging member is sensitized by charging to the appropriate polarity, exposed to a light and shadow image pattern thereby forming a latent electrostatic image on the surface of the imaging member, and the latent image rendered visible by development with colored marking materials, the improvement comprising:

a. providing an imaging member comprising a conductive substrate, a photoconductive insulating layer and an insulating film overcoating the free surface of the photoconductive insulating layer, said insulating film being substantially incapable of supporting injection or transport of charge carriers of either polarity and substantially nonabsorbing of electromagnetic radiation within the wavelength of spectral response of the photoconductive insulating layer, the effective dielectric thickness of the insulating film relative to the photoconductive insulating layer being in the range of about 0.1:1 to about 10:1;

b. establishing an electric field between the surface of the insulating film and the conductive substrate by charging the surface of the insulating film to the appropriate polarity;

c. exposing the photoconductive insulating layer of the imaging member to a light and shadow pattern of activating electromagnetic radiation, whereupon the field in the exposed areas is collapsed across the photoconductive insulating layer and charge carriers become trapped at the interface of the insulating film and the photoconductive insulating layer in substantial correspondence to the photoactivated areas of the photoconductive insulating layer; and

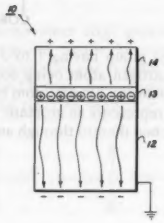
d. contacting the developer laden surface of a conductive electrode with the sensitized surface of the insulating film of the imaging member, whereby mobile carriers at the interface of the photoconductive insulating layer and the conductive substrate are shunted from said interface into said electrode causing selective transfer of developer from the electrode to the surface of the insulating film; and

e. separating the developer laden electrode and the insulating film, whereby mobile charge carriers are shunted from said developer laden electrode back to the interface of the photoconductive insulating layer and the conductive substrate.

3,953,207
COMPOSITE LAYERED PHOTORECEPTOR

Anthony M. Horgan, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 25, 1974, Ser. No. 517,978
Int. Cl.² G03G 5/04; G03C 1/76
U.S. Cl. 96—1 PC **8 Claims**



1. A method of imaging which comprises:

a. providing an imaging member comprising a first layer of electrically active charge transport material contained on a supporting substrate, a photoconductive layer overlying said active layer, and a second layer of electrically active charge transport material overlying said photoconductive layer, one of said electrically active layers exhibits the capability of facile hole injection and transport and the other electrically active layer exhibits the capability of facile electron injection and transport;

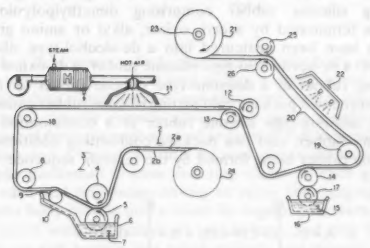
b. electrostatically charging said member; followed by

c. exposing said member to a pattern of activating radiation which results in the generation of electron hole pairs by the photoconductive layer, said holes being injected into and transported through said active layer capable of facile hole injection and transport and said electrons being injected into and transported through said active layer capable of facile electron injection and transport, resulting in the formation of a latent electrostatic image.

3,953,208
BOND-LIKE COPY PAPER BY COCKLING AFTER COATING OR IMAGING

Daniel E. Kane, San Jose, Calif., assignor to SCM Corporation, New York, N.Y.

Filed Jan. 22, 1973, Ser. No. 325,843
Int. Cl.² G03G 5/04; B05D 5/02
U.S. Cl. 96—1.5 **7 Claims**



1. In the process of manufacturing an electrographic layer by the steps of applying a solvent based photoconductive coating to one side of a web and drying the coated web, the improvement comprising the steps of:

a. choosing a flat bond paper for said web as a preliminary step, and

b. applying a macrotexture to said bond paper by cockling the surface thereof subsequent to said drying step through the additional steps of b1) moistening said coated web with an aqueous solution, and b2) drying the moistened web under a controlled light tension to achieve said cockling.

3,953,209
METHOD FOR PREPARING SUPPLEMENTAL FILTER FOR LIGHTHOUSE

Thomas Louis Chase, Lancaster, Pa.; Dino Duranti, and Renato Sassoli, both of Rome, Italy, assignors to RCA Corporation, New York, N.Y.

Filed Aug. 20, 1973, Ser. No. 389,727
Int. Cl.² G03C 5/00
U.S. Cl. 96—38.3 **2 Claims**

1. A method for making a supplemental intensity-correction filter for use with a main intensity-correction filter in an exposure lighthouse for printing a viewing-screen structure for a cathode-ray tube, said lighthouse having an optical system including a lens assembly, said main intensity-correction filter, and means for projecting a light field from a small area light source through said lens assembly to a screen supporting surface, said method comprising:

a. photographically printing said screen structure on said screen supporting surface with said lighthouse comprising said main intensity-correction filter,

b. determining the differences in sizes between elements of said printed screen structure and corresponding elements of a desired screen structure including, for each of said elements,

ii. measuring the size thereof, and i.

ii. calculating the difference in size between said printed element and the corresponding element for said desired screen structure,

c. from said differences in size, determining the differences in brightness at points in said light field at said screen surface required to realize said desired screen structure,

d. producing on a surface of an optical element a supplemental intensity-correction filter whose transmission characteristic corresponds to said differences in brightness including

i. assigning discrete areas of said light field to increments of brightness differences,

ii. preparing a light-opaque stencil for each brightness increment

iii. coating said surface of said optical element with a layer of a photosensitive composition containing light-attenuating material therein,

iv. exposing said coating to a light field through said stencils to photographically print said supplemental intensity correction filter,

v. and then developing said coating.

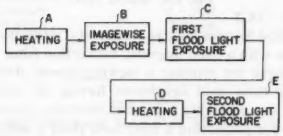
3,953,210
DRY WORKING PHOTOGRAPHIC PROCESS RELATING TO N-VINYL COMPOUND SYSTEM

Katsue Hasegawa; Reiji Sano; Shirow Askawa, and Shunsuke Matsuda, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company Limited, Osaka, Japan

Continuation-in-part of Ser. No. 319,605, Dec. 29, 1972, abandoned. This application July 23, 1974, Ser. No. 490,925
Claims priority, application Japan, Dec. 28, 1971, 47-114
Int. Cl.² G03C 5/32, 5/24, 1/52
U.S. Cl. 96—45.2 **7 Claims**

1. A dry working photographic process of producing a negative image on a photographic film coated with a photosensitive composition comprising N-vinylcarbazole, carbon tetrabromide and 4-(p-dimethylaminostyryl)-quinoline, the composition being dispersed in gelatin in discrete fine particle form, said film being dried and cooled to room temperature subsequent to coating with said composition, the process comprising the steps of:

a. heating said film prior to an imagewise exposure at 60° to 120° C. for 1 to 60 seconds to sensitize said film and to prevent formation of fog in unexposed areas of said film during subsequent steps;
b. imagewisely exposing said film to radiation in the wavelength range of 2500 to 5000 A to produce latent images in the exposed areas;
c. exposing said film to a first flood light radiation in the wavelength range of 5000 to 7000 A with a total energy



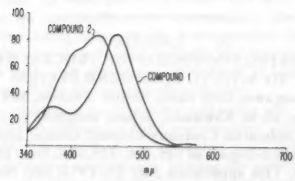
of 1 to 1000 millijoules/cm² with a light intensity of at least 1 mW/cm² to intensify said latent images;
d. heating said film at 60° to 120° C. to develop said latent image into a colored image; and
e. exposing said film to a second flood light radiation in the wavelength range of 3600 to 7000 A with an illumination intensity of 50 to 500 lux for at least 1 second to cause said N-vinylcarbazole in the unexposed areas to photopolymerize to give a colorless polymer.

3,953,211

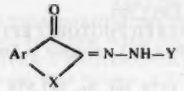
DYE DEVELOPER FOR DIFFUSION TRANSFER ELEMENTS

Shinichi Imai; Shinsaku Fujita; Yukio Maekawa, and Seiki Sakanoue, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 18, 1974, Ser. No. 507,160
Claims priority, application Japan, Sept. 18, 1973, 48-105236
Int. Cl.² G03C *1/76, 1/40, 1/10, 7/00*
U.S. Cl. 96—73 **10 Claims**

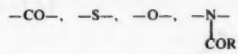


1. A color diffusion transfer photographic light-sensitive material which comprises a support having thereon at least one light-sensitive silver halide emulsion layer containing a silver halide combined with a dye developer, one of the light-sensitive silver halide emulsion layers being combined with a dye developer represented by the following General Formula (I);



(I)

wherein Ar represents a phenylene group; X represents



with R being an alkyl group having 1 to 3 carbon atoms, —NHCO— with the nitrogen atom being connected to the Ar group or —OCO— with the oxygen atom being connected to the Ar group; and Y represents an aromatic phenyl group with a hydroquinone attached thereto through an alkylene linkage.

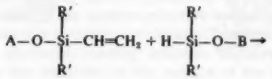
3,953,212

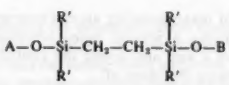
PRE-SENSITIZED LITHOPRINTING PLATE REQUIRING NO FOUNTAIN SOLUTION

Shizuo Miyano; Asaji Kondo; Shinzo Kishimoto, and Kenichiro Yazawa, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

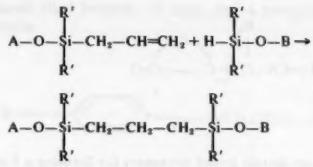
Filed Nov. 2, 1973, Ser. No. 412,517
Claims priority, application Japan, Nov. 2, 1972, 47-110073
Int. Cl.² G03C *1/52, 1/68, 1/72*
U.S. Cl. 96—75 **10 Claims**

1. A pre-sensitized lithoprinting plate comprising a support having an oleophilic surface and having thereon a single coating layer consisting of a heterogeneous mixture of (1) a photosensitive material selected from an o-quinonediazide, an azide compound, a condensate of p-diazodiphenylamine with formaldehyde, a p-quinonediazide, polyvinyl cinnamate, polyvinyl cinnamilidene, poly(cinnamoyloxyethyl acrylate), poly(-cinnamoyloxyethyl methacrylate), copolymers of said acrylates and methacrylates, or an unsaturated polyester comprising the condensation product of p-phenylene diacrylic acid with a polyhydric alcohol containing a cyclohexyl group, and (2) a silicone rubber selected from (a) a single package cold-setting silicone rubber comprising dimethylpolysiloxane chains terminated by acetyl, oxime, alkyl or amino groups which have been heatcured into a de-alcohol-type silicone rubber, a de-acetic acid-type silicone rubber, a de-oxime-type silicone rubber or a deamino-type silicone rubber, or (b) a heat-cured two package cold-setting silicone rubber consisting of an addition-type silicone rubber or a condcnsation-type silicone rubber, said two package cold-setting addition-type silicone rubber being formed by the reaction sequence:

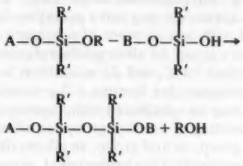




or from the reaction sequence:



wherein R′ is a monovalent alkyl group, a monovalent aryl group, a cyanoaryl group, and is the same or different group and A and B are organosiloxane residue groups; and wherein aid two package cold-setting condensation-type silicone rubber is formed by the reaction sequence:

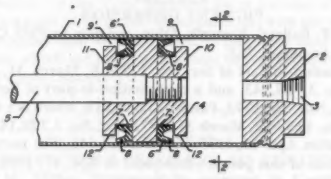


wherein R′ is a monovalent alkyl group, a monovalent aryl group, a cyanoaryl group, and is the same or different group, R is an alkyl group having 1 to 3 carbon atoms, and A and B are organosiloxane residue groups; the weight ratio of said photosensitive material to said silicone rubber is from 0.1 to 1.1, and wherein said coating has a thickness of about 1 to 10 microns.

3,953,213
PISTON CONSTRUCTION FOR FLUID POWER CYLINDERS

Ralph L. Gasper, Lansing, Ill., assignor to Bimba Manufacturing Company, Monee, Ill.

Filed Apr. 5, 1974, Ser. No. 458,083
Int. Cl.² F16J 9/08
U.S. Cl. 92—184 **3 Claims**



1. In a fluid power cylinder having a cylinder body portion, end closure members, fluid port means, a movable one-piece double-acting piston member and piston rod means, full depth peripheral annular grooves around said piston member that are spaced from the ends thereof to provide full diameter end portions and a center portion for said piston member, and laterally positioned U-form seal ring means in each groove with each seal ring means having an upper lip engaging said cylinder body portion and a lower lip engaging the bottom of the groove with the hollow of said U-form seal ring means facing an end portion and being entirely and directly open thereto, the improved construction to prevent low pressure fluid from being trapped in the hollow of the U-form seal means, which comprises, providing notch means in the outer periphery of each of the end portions of said piston member to a depth reaching a midportion of each groove and hollow of said U-form seal ring means and to form resulting lateral vent openings to the interior portion of each seal ring means being held within said grooves while leaving the remainder of the periphery of the ends of the piston member at a full diameter and the remainder of the grooves at full depth.

3,953,214
PHOTOPOLYMERIZABLE SCREEN PRINTING INKS AND USE THEREOF

Melvin A. Lipson, Fullerton, and Dale W. Knoth, Norwalk, both of Calif., assignors to Dynachem Corporation, Santa Fe Springs, Calif.

Filed May 24, 1974, Ser. No. 473,236
Int. Cl.² G03C 1/68, 5/00
U.S. Cl. 96—115 P **7 Claims**

1. A photopolymerizable screen printing ink which comprises:

A. 25 to 50% by weight of a photopolymerizable monomeric material containing at least 20 weight percent hydroxyalkyl acrylate or methacrylate;

B. 20 to 60% by weight of a polyester binder having a molecular weight of from 500 to 50,000;

C. 5 to 10% by weight of a free radical generating addition polymerizing initiating system;

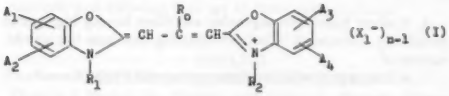
said photopolymerizable composition having a viscosity of from 5,000 to 200,000 centipoises, an acid number of from 0 to 120, and a thixotropic index of from 1.00 to 4.00.

3,953,215
SILVER HALIDE PHOTOGRAPHIC EMULSIONS

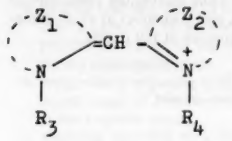
Masanao Hinata; Haruo Takei; Akira Sato; Masao Takano, and Nobuaki Miyasaka, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 16, 1974, Ser. No. 489,013
Claims priority, application Japan, July 16, 1973, 48-80110
Int. Cl.² G03C 1/14
U.S. Cl. 96—124 **11 Claims**

1. A silver halide photographic emulsion containing in a supersensitizing amount the combination of at least one sensitizing dye represented by the general formula (I)



wherein, A_1, A_2, A_3 and A_4 each represents a member selected from the group consisting of a hydrogen atom, a lower alkyl group, an alkoxy group, a halogen atom, a hydroxyl group, an aryl group, a carboxyl group, an alkoxycarbonyl group, a cyano group, a trifluoromethyl group, an amino group, an acylamido group, an acyloxy group, an alkoxycarbonylamino group, and a carbalkoxy group; and A_1 and A_2 and A_3 and A_4 can combine to form a naphthoxazole nucleus; R_o represents a hydrogen atom, a lower alkyl group or an aryl group; R_1 and R_2 each represents an alkyl group, provided that at least one of R_1 or R_2 represents a sulfoalkyl group; X_1 represents an anion; and n is equal to 1 or 2 with n being equal to 1 when the sensitizing dye forms an intramolecular salt, and at least one sensitizing dye represented by the general formula (II)



(II)

wherein Z_1 and Z_2 each represents the non-metallic atoms necessary to form a nucleus selected from the group consisting of a thiazole nucleus, a thiazoline nucleus, an oxazole nucleus, a selenazole nucleus, a 3,3-dialkylindolenine nucleus and an imidazole nucleus; R_3 and R_4 each represents an alkyl group; X_2 represents an anion; m is equal to 1 or 2 with m being equal to 1 when the sensitizing dye forms an intramolecular salt.

3,953,216

SPECTRALLY SENSITIZED SILVER HALIDE PHOTOGRAPHIC EMULSION

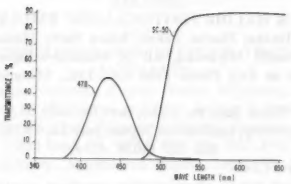
Masanao Hinata; Haruo Takei; Akira Sato, and Akira Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 16, 1974, Ser. No. 498,143

Claims priority, application Japan, Aug. 16, 1973, 48-91896

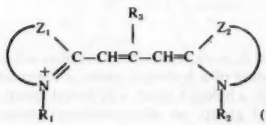
Int. Cl.² G03C 1/14

U.S. Cl. 96—126 **7 Claims**



1. A silver halide photographic emulsion having high green sensitivity containing in supersensitizing amounts the combination of

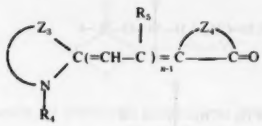
1. at least one sensitizing dye represented by the formula (I)



(I)

wherein Z_1 and Z_2 are the atomic groups necessary for forming a benzoxazole ring or a naphthoxazole ring, in which a benzene nucleus of the ring may be substituted; R_1 and R_2 are aliphatic groups and at least one of R_1 and R_2 is a carboxyalkyl group or a sulfoalkyl group; R_3 is a hydrogen atom or an alkyl group; X is an acid anion; and m is 1 or 2 and m is 1 when the dye forms an intramolecular betaine like salt, and

2. at least one sensitizing dye represented by the formula (II)



(II)

wherein Z_3 is an atomic group necessary for forming a 5-membered or 6-membered heterocyclic ring selected from the group consisting of a pyridine ring, a quinoline ring, an oxazoline ring, an oxazole ring, a thiazoline ring, a thiazole ring, a selenazole ring, a benzoxazole ring, a benzothiazole ring, a benzoselenazole ring, a benzimidazole ring, a dialkylindolenine ring, a α-naphthoxazole ring, a β-naphthoxazole ring, a β,β-naphthoxazole ring, a α-naphthothiazole ring, a β-naphthothiazole ring, a β,β-naphthothiazole ring, a α-naphthoselenazole ring, a tetrazole ring and a pyrroline ring, which may be substituted with one or more of a halogen atom, an alkyl group, an alkoxy group, an alkoxycarbonyl group, and an aryl group as described for Z_1 and Z_2 in addition to R_4; Z_4 is an atomic group necessary for forming a 2-pyrazoline-5-one ring nucleus which may be substituted with a member selected from the group consisting of an alkyl group, an alkoxy group, an alkoxycarbonyl group, an aryl group, an alkoxyalkyl group, an N-(N,N-dialkylaminoalkyl)carbamoylalkyl group, an N-(N,N,N-trialkylammoniumalkyl)carbamoylalkyl group, an N,N,N-trialkylammoniumalkyl group, a hydroxyalkyl group, a carboxyalkyl group, a sulfoalkyl group, and an amino group; R_4 is an aliphatic group; R_5 is a hydrogen atom, an alkyl group, or an aryl group; and n is 1 or 2.

3,953,217

LIQUID POLISH

John Goracke, P.O. Box 103, Yuma, Ariz. 85364

Filed Dec. 9, 1974, Ser. No. 530,752

Int. Cl.² C09G 1/02, 1/06

U.S. Cl. 106—8 **2 Claims**

1. A liquid polish comprising, by volume, 1 to 16% isoamyl acetate, ¼ to 4% calcium oxide, ¼ to 6% tung oil, ¼ to 8% sodium bicarbonate, ¼ to 8% boric acid, and the balance of turpentine.

3,953,218

PIGMENT DISPERSION

Edward T. Pollard, Norwalk, Ohio, assignor to PMS Consolidated, Somerset, N.J.

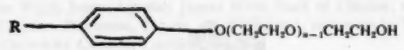
Continuation-in-part of Ser. No. 129,968, March 31, 1971, Pat. No. 3,728,143, and a continuation-in-part of Ser. No. 310,022, Nov. 28, 1972, Pat. No. 3,844,810, which is a division of Ser. No. 129,968, March 31, 1971, Pat. No. 3,728,143. This application Apr. 16, 1973, Ser. No. 351,641. The portion of the term of this patent subsequent to Apr. 17, 1990, has been disclaimed.

Int. Cl.² C09D 11/00

U.S. Cl. 106—19 **23 Claims**

1. The process of preparing coated pigment particles in a liquid form, for compounding with a thermoplastic, a thermoset and combinations thereof which comprises: (a) preparing a liquid heated admixture of a molten fatty acid amide, pigment particles and a non-solvent diluent, said pigment not being soluble in said thermoplastic, said thermoset and combinations thereof, said fatty acid amide being solid at room temperature, said non-solvent diluent being selected from the group consisting of (i) a non-solvent liquid fatty acid ester which is selected from the group consisting of ethyl formate, ethyl caprylate, ethyl propionate, ethyl butyrate, propyl acetate, butyl acetate, butyl formate and methyl butyrate, (ii) a liquid wetting-agent which is selected from the group consisting of a liquid sodium salt of an alcohol sulfate, a liquid amine salt of an alcohol sulfate, a liquid alcohol phosphate, a liquid aliphatic sulfonate, a liquid alkylaryl sulfonate, a liquid alcohol/ethylene oxide adduct, a liquid alkyl betaine - C type,

a liquid alkyl betaine - N type, and a compound having the formula:



wherein R is alkyl and *n* is the number of moles of ethylene oxide, (iii) a non-solvent liquid vegetable oil which is selected from the group consisting of castor oil, olive oil, peanut oil, rape oil, corn oil, soybean oil, linseed oil, tung oil, and oiticica oil, (iv) a non-solvent liquid animal oil which is selected from the group consisting of lard oil, neat's foot oil, whale oil and fish oil, (v) a non-solvent liquid glycol which is selected from the group consisting of ethylene glycol, propylene glycol and 1,3-butylene glycol, (vi) glycerol, (vii) a mineral oil and (viii) combinations thereof, the amine radical or radicals in the fatty acid amide containing 0 to 36 carbon atoms, the fatty acid radical or radicals in the fatty acid amide containing 1 to 36 carbon atoms, and said fatty acid amide can be substituted by hydroxyl groups, and (b) cooling the admixture to room temperature.

3,953,219

POWDERY COMPOSITION FOR HEAT RETENTION OF FEEDER HEAD

Masaru Takashima, Wakabaya, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 269,091, July 5, 1972, abandoned. This application Sept. 20, 1974, Ser. No. 507,717
Claims priority, application Japan, July 10, 1971, 46-50717
Int. Cl.² B28B *7/36*
U.S. Cl. 106—38.27 **12 Claims**

1. In a powdery composition for heat retention of feeder head which comprises from about 5 to about 25% by weight of a carbonized plant material and from about 75 to about 95% by weight of a mixture including at least one refractory material, at least one easily oxidizable metal, at least one metal oxide and at least one inorganic material effective for heat retention of feeder head; the improvement comprising each of the ingredients in said mixture having a particle size distribution, by the Tyler Standard Sieve System, of less than 50% by weight of 48 to 200 mesh particles, with the remainder being coarser than 48 mesh particles plus finer than 200 mesh particles which are present in a ratio of coarser to finer particles of approximately 1:1.

3,953,220

REFRACTORY CELSIAN GLASS-CERAMICS

David M. Miller, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 26, 1974, Ser. No. 492,053
Int. Cl.² C03C *3/22;* **C03B** *32/00*
U.S. Cl. 106—39.8 **3 Claims**

1. A method for making a glass-ceramic article exhibiting a coefficient of thermal expansion over the range of R.T. to 900°C. of about 35–50 × 10^{-7}/°C., a use temperature under load up to about 1250°C., and a density of about 3.1–3.5 g/cc, said article consisting predominantly of celsian solid solution crystals and rutile crystals homogeneously dispersed within a glassy matrix with said crystals constituting at least 75% by volume of the article, which comprises:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 20–35% BaO, 20–35% Al_2O_3, 20–40% SiO_2, 5–15% PbO and/or P_2O_5, the total PbO + P_2O_5 not exceeding about 20%, and 7–12% TiO_2 as a nucleating agent;

b. simultaneously cooling the melt to at least within the transformation range thereof such that said melt is transformed into an amorphous solid and shaping a glass body therefrom;

c. heating said glass body above the transformation range thereof to a temperature between about 1050°–1300°C. for a period of time sufficient to effect the desired nucleation and crystallization of celsian solid solution crystals and rutile crystals; and then

d. cooling the crystallized article to room temperature.

3. A glass-ceramic article made by the process of claim 1.

3,953,221

FULLY DENSE CERAMIC ARTICLE AND PROCESS EMPLOYING MAGNESIUM OXIDE AS A SINTERING AID

Frederick F. Lange, Murrysville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 22, 1975, Ser. No. 570,543
Int. Cl.² C04B *35/58*
U.S. Cl. 106—62 **4 Claims**

1. A process for producing a fully dense ceramic article which comprises the steps of

a. mixing Si_3N_4, Al_2O_3 and MgO powders to form a composite powder composition wherein the composition comprises about 50 to about 80 weight percent of Si_3N_4, about 15 to about 50 weight percent of Al_2O_3, and about 0.25 to about 5 weight percent of MgO based on the total weight of the composition;

b. forming the composite powder composition into a desired shape; and

c. heating the shaped composite powder composition in an non-oxidizing atmosphere under ambient pressure at a sintering temperature from about 1400°C to about 1750°C.

3,953,222

ADDITION OF ACIDULATED POZZOLAN TO CONCRETE AND CONCRETE PRODUCTS

John W. Bainton, Nassau, Bahamas, assignor to Tekology Corporation, Palisades Park, N.J.

Filed Apr. 10, 1974, Ser. No. 459,587
Int. Cl.² C04B *7/02*
U.S. Cl. 106—97 **16 Claims**

1. The method of making cementitious structures including the steps of treating pozzolanic material particles of the type comprising a lattice work of silicon dioxide molecules having interspersed between them metallic oxides, the treating employing a mineral acid in sufficient quantity to convert said metallic oxides into soluble salts of the mineral acid, separating most of the salts and any excess acids from the treated pozzolanic material, mixing the treated material with a settable concrete mix including aggregate and water, and molding said mix and allowing it to set to form said structure.

3,953,223

SILICEOUS PIGMENT COMPOSITION

Thomas J. Doran, Jr., Norton, and Henry C. Stevens, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 205,295, Dec. 6, 1971, Pat. No. 3,821,133. This application Apr. 5, 1974, Ser. No. 458,280
Int. Cl.² C09C *1/28*
U.S. Cl. 106—308 N **5 Claims**

1. A composition useful for reinforcing rubber, which comprises reinforcing siliceous pigment having adsorbed on its surface (a) a compound selected from polymers of ethylenimine, propylenimine, 1,2-butylenimine, 2,3-butylenimine, 2-methyl propylenimine, alkyloxyalkylenimine, unsaturated polyalkylene amines and cycloalkylenimines, said polymers having a plurality of reactive amino groups, at least one of which reactive amino groups is a primary amino group, and (b) a methylene-donor compound selected from hexamethylenetetramine, hexamethoxymethyl melamine and parafor-

maldehyde, each of said adsorbed compounds being present on the siliceous pigment in an amount of between about 0.1 and about 15 parts per 100 of rubber reinforced by said pigment.

3,953,224

EXTRACTION TOWER FOR SUGAR BEETS COSSETTES OR CRUSHED SUGAR CANE

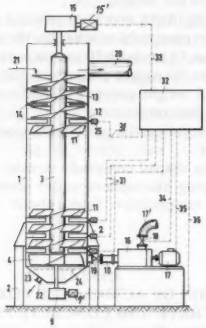
Walter Dietzel, and Siegfried Matusch, both of Braunschweig, Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

Filed Mar. 7, 1975, Ser. No. 556,301

Claims priority, application Germany, Mar. 16, 1974, 2412738

Int. Cl.² C13D 1/12

U.S. Cl. 127—5 **11 Claims**



1. An extraction tower for conveying material through a leaching path in counter-current fashion relative to a leaching liquid flow, comprising a tower housing, a plurality of material conveying means including rotatable screw means and tiltably supported baffle means operatively arranged inside said tower for conveying said material through the tower housing, sensor means operatively secured to any of said conveying means to sense loads to which the respective conveying means are subjected in operation inside said tower, control means responsive to said sensor means, drive means individually connected to said material conveying means, and means connecting at least certain of said drive means to said control means for individually regulating said drive means in response to respective load signals received from corresponding ones of said sensor means.

3,953,225

BASIC UNIT PROCESSOR FOR OFFSET PLATES AND METHOD OF PROCESSING THEM

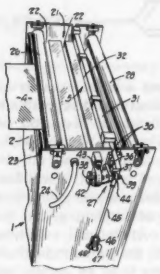
John C. Hovekamp, Mansfield, Ohio, assignor to Buckler Industries, Inc., Mansfield, Ohio

Filed Aug. 8, 1973, Ser. No. 386,510

Int. Cl.² B08B 7/00; G03D 3/08

U.S. Cl. 134—9 **13 Claims**

1. A process for contacting a plate or sheet with a process liquid comprising feeding said plate into a first pair of coupled drive rolls adapted to receive said plate therebetween and to urge said plate therethrough, rectilinearly, reciprocatingly, rubbing a surface of said plate with a resilient rubbing means, feeding said plate into a second pair of coupled drive rolls adapted to receive said plate therebetween and to urge said plate therethrough, operating said first and second pair of coupled drive rolls and said rubbing means with a singular



drive means, and recirculatably supplying said process liquid to said surface of said plate.

3,953,226

TANK CLEANING APPARATUS

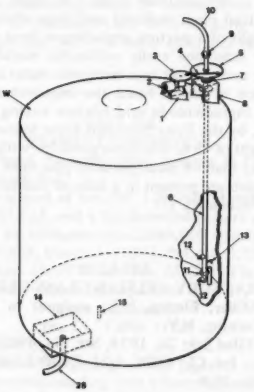
Joseph Maurice Emond, Longeuil, and James Dawson Haigh, St. Lambert, both of Canada, assignors to The Molson Companies Limited, Rexdale, Canada

Filed Oct. 16, 1974, Ser. No. 515,418

Claims priority, application Canada, July 24, 1974, 205547

Int. Cl.² B08B 3/02, 9/12

U.S. Cl. 134—104 **5 Claims**

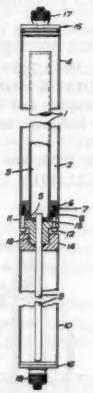


1. Apparatus for scouring a hot wort tank from sludge, including a hot water pipe vertically mounted adjacent a side wall within said tank and depending from the top thereof and having its upper end projecting from said tank; jet means located on, and adjacent to, the lower end of said pipe; and means located on the outside of said tank for automatically oscillating said pipe about the vertical axis whereby, when desired, hot water issuing from said jets will scour the sludge into a sump located in the bottom of said tank, said oscillating means including a motor and a drive from the latter to a circular plate disposed about and fast with the upper end of said pipe, said drive including link means for oscillating said plate.

3,953,227
ELECTROCHEMICAL CELLS HAVING A LIQUID ALKALI METAL ELECTRODE AND SOLID ELECTROLYTE

Ivor Wynn Jones; Lyndon James Miles, both of Chester, and Graham Robinson, Tarvin, all of England, assignors to The Electricity Council, London, England

Continuation of Ser. No. 477,937, June 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 430,363, Jan. 2, 1974. This application Sept. 20, 1974, Ser. No. 508,006
Claims priority, application United Kingdom, Jan. 3, 1973, 396/73
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 FS 11 Claims



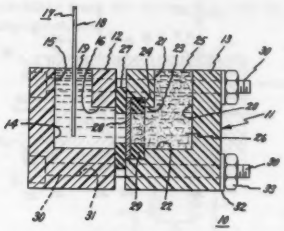
1. A rechargeable electrochemical cell comprising a tubular housing, an upright solid electrolyte tube within said tubular housing, a liquid alkali metal adjacent one face of the electrolyte tube, and a cathodic reactant adjacent the other face of the electrolyte tube, said electrolyte tube being closed at one end and the cathodic reactant-containing reservoir being provided in said housing above the top of the electrolyte tube, a rerservoir for the liquid alkali metal below the electrolyte tube, and gas pressure means for raising the alkali metal from the alkali metal reservoir to lie in contact with the whole of said one face of the electrolyte tube.

3,953,228
SEALED LITHIUM-REDUCIBLE SULFUR OXYHALIDE CELL

Walter L. Roth, Schenectady, and Gregory C. Farrington, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,583
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 FS 5 Claims

1. A sealed lithium-reducible sulfur oxyhalide cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam and lithium in an nonaqueous electrolyte, a cathode positioned within the casing, the cathode selected from the class consisting of a reducible sulfur oxyhalide, and a reducible sulfur oxyhalide with an ionic conductivity enhancing material, and a solid lithium-sodium aluminate electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode, the solid lithium-sodium aluminate electrolyte having an appropriate

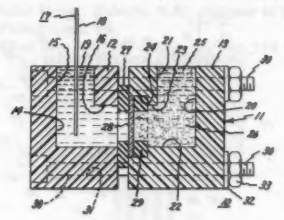


composition of $LiNaO \cdot 9Al_2O_3$ of which 1.3 to 85.0% of the total alkali ion content is lithium.

3,953,229
SEALED LITHIUM-REDUCIBLE PHOSPHOROUS OXYHALIDE CELL

Walter L. Roth, Schenectady, and Gregory C. Farrington, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 12, 1975, Ser. No. 557,584
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 FS 4 Claims



1. A sealed lithium-reducible phosphorous oxyhalide cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam and lithium in a non-aqueous electrolyte, a cathode positioned within the casing, the cathode selected from the class consisting of a reducible phosphorous oxyhalide, and a reducible phosphorous oxyhalide with an ionic conductivity enhancing material, and a solid lithium-sodium aluminate electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode, the solid lithium-sodium aluminate electrolyte having an approximate composition of $LiNaO \cdot 9Al_2O_3$ of which 1.3 to 85.0% of the total alkali ion content is lithium.

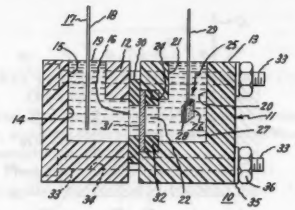
3,953,230
SEALED LITHIUM-PHOSPHOROUS CELL

Gregory C. Farrington, Elnora, and Walter L. Roth, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,500
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 LN 3 Claims

1. A sealed lithium-phosphorous cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam and lithium in a nonaqueous electrolyte, a cathode positioned within the casing, the cathode comprising phosphorous in a nonaqueous solvent with an ionic conductivity enhancing material, and a solid lithium-sodium aluminate electrolyte

positioned within the casing between the anode and cathode and in contact with both the anode and cathode, the solid lithium-sodium aluminate electrolyte having an approximate composition of $LiNaO \cdot 9Al_2O_3$ of which 1.3 to 85.0% of the total alkali ion content is lithium.

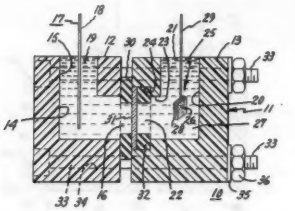


3,953,231

SEALED LITHIUM-SOLID SULFUR CELL

Gregory C. Farrington, Elnora, and Walter L. Roth, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1975, Ser. No. 571,556
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 LN 4 Claims



1. A sealed lithium-solid sulfur cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam and lithium in a non-aqueous electrolyte, a cathode positioned within the casing, the cathode comprising solid sulfur in a nonaqueous solvent with an ionic conductivity enhancing material, and a solid lithium-sodium aluminate electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode, the solid lithium-sodium aluminate electrolyte having an approximate composition of $LiNaO \cdot 9Al_2O_3$ of which 1.3 to 85.0 percent of the total alkali ion content is lithium.

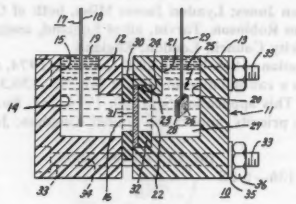
3,953,232

SEALED LITHIUM-REDUCIBLE METAL SALT CELL

Walter L. Roth, Schenectady, and Gregory C. Farrington, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,278
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 LN 3 Claims

1. A sealed lithium-reducible metal salt cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam and lithium in a nonaqueous electrolyte, a cathode positioned within the casing, the cathode comprising a reducible metal salt, selected from the class consisting of a transition metal fluoride, chloride, iodide, sulfide or oxide in a nonaqueous solvent with an ionic conductivity enhancing material, and a solid lithium-sodium aluminate electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode, the solid lithium-sodium aluminate electrolyte having an approximate composition of $LiNaO \cdot 9AL_2O_3$ of which 1.3 to 85.0% of the total alkali ion content is lithium.

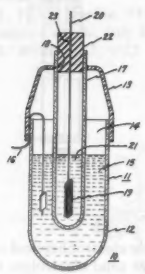


3,953,233

SEALED LITHIUM-SULFUR MONOCHLORIDE CELL

Walter L. Roth, Schenectady, and Gregory C. Farrington, Elnora, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,990
Int. Cl.² H01M 10/00
U.S. Cl. 136—6 FS 3 Claims



1. A sealed lithium-sulfur monochloride cell comprises a casing, an anode positioned within the casing, the anode selected from the class consisting of lithium, lithium as an amalgam and lithium in a non-aqueous electrolyte, a cathode positioned within the casing, the cathode comprising sulfur monochloride with an ionic conductivity enhancing material, and a solid lithium-sodium aluminate electrolyte positioned within the casing between the anode and cathode and in contact with both the anode and cathode, the solid lithium-sodium aluminate electrolyte having an approximate composition of $LiNaO \cdot 9A1_2O_3$ of which 1.3 to 85.0% of the total alkali ion content is lithium.

3,953,234

ELECTRODEPOSITION AND ELECTRODISSOLUTION OF ALKALI METALS IN NONAQUEOUS SOLUTION

Arthur Kentaro Hoffmann, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 427,973, Jan. 25, 1965, abandoned, which is a continuation-in-part of Ser. No. 403,659, Oct. 13, 1964, abandoned. This application Sept. 21, 1967, Ser. No. 669,373
Int. Cl.² H01M 6/18; C25C 1/02
U.S. Cl. 136—6 LN 28 Claims

1. An anhydrous liquid electrolyte solution in an electrochemical cell which solution comprises an electrolyte salt

dissolved in a mixed liquid solvent which consists essentially of sulfur dioxide and at least one organic compound having no acidic hydrogen atoms and containing an element having at least one unshared electron pair, said electrolyte solution having specific conductivity of at least $10^{-3}ohm^{-1}cm^{-1}$ at 22°C. and substantially higher than the specific conductivity of solutions having the same components but absent either the sulfur dioxide or the secondary solvent components.

3,953,235

NONAQUEOUS CELL HAVING AN ELECTROLYTE CONTAINING CROTONITRILE

George E. Blomgren, Lakewood, Ohio, and Gerald H. Newman, Westfield, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,716
Int. Cl.² H01M 4/36
U.S. Cl. 136—20 **10 Claims**

1. A nonaqueous cell comprising a highly active metal anode selected from the group consisting of lithium, sodium, potassium, calcium, magnesium and their alloys, a solid cathode and a nonaqueous electrolyte comprising crotonitrile, at least one cosolvent selected from the group consisting of propylene carbonate, ethylene carbonate, γ-butyrolactone, nitrobenzene, methyl acetate, sulfolane, 3-methyl sulfolane, methyl formate, dimethyl sulfoxide, propylene glycol sulfite and diethyl sulfite, and an ionizable solute.

3,953,236

LEAD STORAGE BATTERY

Takashi Ito, Toyonaka, and Koichiro Ohtomo, Takatsuki, both of Japan, assignors to Kanebo Kabushiki Kaisha, Tokyo and Ko Kondo, both of, Japan

Filed Aug. 30, 1974, Ser. No. 502,222
Claims priority, application Japan, Sept. 5, 1973, 48-99950
Int. Cl.² H01M 4/36
U.S. Cl. 136—26 **1 Claim**

1. A paste-type lead storage battery comprising unit cells each being constructed in laminated form including a positive plate coated on both surfaces thereof with an active material, a fibrous structure placed on each side of said positive plate, and a negative plate placed on each said fibrous structure, the improvement comprising a separator interposed between said fibrous structure and said negative plate on both sides of said positive plate, said separator consisting of a paper-like sheet having continuous micro-porous openings throughout the entire area thereof and containing at least 70% by weight of phenol resin fibers, each having a diameter of 5 microns or less, produced by melt-spinning and curing a novolak resin, said phenol resin fibers having at at least 60% by mole of the phenolic hydroxyl groups of said resin being capped to esterify or etherify said phenolic hydroxyl groups.

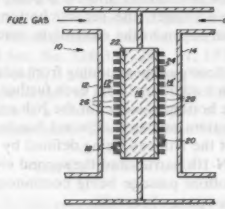
3,953,237

ELECTRIC ENERGY SOURCES SUCH AS FUEL CELLS AND BATTERIES

Sheldon L. Epstein, Wilmette, Ill., and Bernard W. Wessling, Winthrop, Mass., assignors to Brunswick Corporation, Skokie, Ill.

Continuation of Ser. No. 160,170, July 6, 1971, abandoned, which is a division of Ser. No. 160,169, July 6, 1971, Pat. No. 3,826,686. This application Nov. 4, 1974, Ser. No. 520,287
Int. Cl.² H01M 4/00
U.S. Cl. 136—86 R **11 Claims**

1. An electrical energy source comprising:
manifolds for fluids;
an electrolyte; and
electrodes interfacing between the electrolyte and the interior space of the manifolds, one electrode comprising:
a permeable, electrically conductive metallic layer in contact with the electrolyte, and a plurality of metal fiber wicks, each wick characterized by:
a. being substantially separated from each other wick such that the space therebetween will not support any substantial volume of electrolyte,
b. being secured to the conductive layer,
c. extending from the conductive layer in parallel arrangement, and



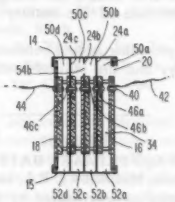
d. comprising a plurality of substantially solid textile metal fibers closely spaced but defining a parallel of spaced void compartments separating the metal fibers in such a manner that the void spaces can support electrolyte between the fibers in these void spaces and wherein the fibers extend into the adjacent interior space of the contiguous manifold.

3,953,238

MULTICELL SEAWATER BATTERY

Harold Nickolas Honer, Raleigh, N.C., assignor to ESB Incorporated, Philadelphia, Pa.

Filed Sept. 16, 1974, Ser. No. 506,314
Int. Cl.² H01M 6/30
U.S. Cl. 136—90 **8 Claims**



1. In a Multicell Seawater Battery of N cells each cell including a first electrode, a second electrode and an electrolyte space therebetween, the battery having a top, a bottom, a first sidewall and a second sidewall, a first endwall adjacent to the first cell and a second endwall adjacent the Nth cell, N−1 non conductive barriers, a barrier located between each adjacent pair of cells of the battery, the electrodes of the cells, the endwalls and the barriers being parallel one to another, the improvements comprising:
a. a first top passage running from sidewall to sidewall, the first top passage defined by the battery top, the first endwall and the first barrier, the first top passage being continuously open to the electrolyte space of the first cell;
b. a second top passage running from sidewall to sidewall, the passage defined by the battery top, the first barrier and the second barrier, the second top passage being continuously open to the electrolyte space of the second cell;
c. further top passages running from sidewall to sidewall, one for each additional cell, each further top passage except the top passage of the Nth cell defined by the battery top and two adjacent barriers, the top passage of the Nth cell being defined by the battery top, the N−1th barrier and the second endwall, and each further top passage being continuously open to the electrolyte space of its cell;

d. a first bottom passage running from sidewall to sidewall, the first bottom passage defined by the battery bottom, the first endwall and the first barrier, the first bottom passage being continuously open to the electrolyte space of the first cell;

e. a second bottom passage running from sidewall to sidewall the second bottom passage defined by the battery bottom, the first barrier and the second barrier, the second bottom barrier, the second bottom passage being continuously open to the electrolyte space of the second cell;

f. further bottom passages running from sidewall to sidewall one for each additional cell, each further bottom passage except the bottom passage for the Nth cell defined by the battery bottom and two adjacent barriers, the bottoom passage of the Nth cell being defined by the battery bottom, the N-1th barrier and the second endwall, and each further bottom passage being continuously open to the electrolyte space of its cell;

g. a first top port formed in the first endwall of the battery located near to the first sidewall of the battery the first top port providing access between the first top passage and the space external to the battery;

h. a second top port formed in the barrier between the first cell and the second cell, the second top port providing access between the second top passage and the first top passage, the second top port being located near to the second sidewall of the battery;

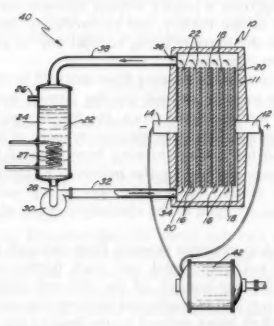
i. further top ports one formed in each further barrier including the barrier between the N-1th cell and the Nth cell the further ports being located consecutively near to the first sidewall of the battery and the second sidewall thereof, each further top port providing access between adjacent top passages, the series of N ports and N passages forming a conduit the path of the conduit being of zig-zag form comprising a series of straight portions connected by reverse bends, the straight portions running from the first side of the battery to the second side thereof; and,

j. a means for providing access between the space external to the battery and the several bottom passages of the battery.

3,953,239
Al-AgO PRIMARY BATTERY

George E. Anderson, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 27, 1975, Ser. No. 544,591
Int. Cl.² H01M 45/02
U.S. Cl. 136—100 R **3 Claims**



1. A primary battery system comprising:

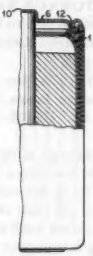
a loop comprising a reservoir including a heat exchanger, a pump and a battery connected serially by means of piping; and

a motor electrically connected to said battery, said battery including a battery housing having inlet and outlet ports for receiving said piping, a plurality of aluminum anode plates enclosed in said housing, a plurality of silver oxide cathode plates enclosed in said housing with each of said cathode plates paired with a respective anode plate, a plurality of intercell connectors respectively disposed between and touching successive pairs of said cathode and anode plates, and an electrolyte disposed between and touching each of said pairs of said cathode and anode plates, said electrolyte comprises an aqueous solution of 10 to 50 per cent concentrate selected from the group of potassium hydroxide, sodium hydroxide and lithium hydroxide, said electrolyte is pre-heated to a temperature between 120° and 180° F.

3,953,240
SEALING ELEMENT FOR ELECTRIC PRIMARY CELLS HAVING STEEL CASINGS

Hermann Füllenbach; Friedrich Christof, and Alois Fränzl, all of Ellwangen, Jagst, Germany, assignors to Varta Batterie AG, Kelkheim, Taunus, Germany

Filed July 9, 1973, Ser. No. 377,709
Claims priority, application Germany, July 29, 1972, 2237398
Int. Cl.² H01M 1/02
U.S. Cl. 136—107 **3 Claims**



1. An electric primary cell comprising a steel casing, a cup electrode having an inwardly flanged upper rim disposed in said steel casing, a cardboard sleeve in said steel casing between the latter and said cup electrode, said steel casing having an inwardly flanged upper edge, a cover disc having an outer edge extending beneath the inwardly flanged upper edge of said steel casing, and a sealant of resilient plastic material between said inwardly flanged upper rim of said cup electrode and said outer edge of said cover disc, said sealant being undetachably connected by dispensing on the underside surface of said outer edge of said cover disc.

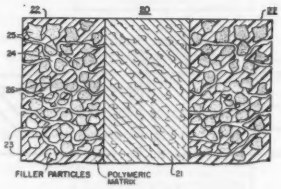
3,953,241
HEAT RESISTANT SUBSTRATES AND BATTERY SEPARATORS MADE THEREFROM

Alois Langer, Pittsburgh; Luciano C. Scala, Murrysville, and Charles R. Ruffing, Edgewood, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 19,009, March 12, 1970, Pat. No. 3,749,604. This application Mar. 26, 1973, Ser. No. 345,157
Int. Cl.² H01M 2/14
U.S. Cl. 136—145 **7 Claims**

1. A flexible porous substrate comprising a caustic resistant porous flexible support, at least one side of which is in contact with and attached to a membrane consisting essentially of a caustic resistant solid polymeric matrix containing a network of a plurality of interconnected pores having diameters between about 5 to 75 microns, and interdispersed caustic resis-

tant inorganic filler particles having a particle size diameter of between about 74 to 700 microns, wherein the weight ratio of



filler:polymer in the polymeric matrix ranges from 1:1 to 5:1 so that there are a large number of filler particle contact points in the polymeric matrix.

3,953,242

NOVEL PRODUCTS

Arnold Hoffman, Brookline, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 50,354, June 26, 1970. This application Oct. 26, 1973, Ser. No. 409,857

Int. Cl.² H01M *6/04*

U.S. Cl. 136—155 **9 Claims**

1. A galvanic cell comprising a metallic anode and a slurry cathode wherein the sole electrolyte consists of a quaternary ammonium halide.

3,953,243

METHOD FOR SETTING THE LIFETIME OF CHARGE CARRIERS IN SEMICONDUCTOR BODIES

Adolf Goetzberger, Merzhausen; Max Schulz, Gundelfingen, and Alois Sonntag, Mulheim, all of Germany, assignors to LICENTIA-Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Aug. 12, 1974, Ser. No. 497,143

Claims priority, application Germany, Aug. 16, 1973, 2341311

Int. Cl.² H01L *21/263*

U.S. Cl. 148—1.5 **10 Claims**

1. Method for setting the lifetime of charge carriers in semiconductor bodies for semiconductor devices by the diffusion of recombination centers, comprising: applying the recombination center forming material to the surface and into the surface layer of the semiconductor body in a quantity which corresponds to the desired final concentration of said material in the semiconductor body by means of ion implantation; and heating the semiconductor body to a temperature sufficient to cause diffusion of the implanted ions into the remainder of the semiconductor body until an approximately stationary value for the charge carrier lifetime has developed in the entire volume of the semiconductor body.

3,953,244

METHOD OF FABRICATING STABLE WROUGHT LEAD-CALCIUM-TIN ALLOYS BY MEANS OF COLD WORKING

Raymond D. Prengaman, Arlington, Tex., assignor to St. Joe Minerals Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 472,113, May 22, 1974, abandoned, which is a continuation-in-part of Ser. Nos. 394,096, Sept. 4, 1973, abandoned, and Ser. No. 369,452, June 13, 1973, abandoned, said Ser. No. 394,096, is a continuation of Ser. No. 328,333, Jan. 31, 1973, abandoned, said Ser. No. 369,452, is a division of Ser. No. 328,333, , which is a continuation-in-part of Ser. No. 72,825, Sept. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 4,240, Jan. 20, 1970, abandoned. This application May 30, 1975, Ser. No. 582,119

Int. Cl.² B23K *19/00*

U.S. Cl. 148—2 **35 Claims**

1. A process for the preparation of stable wrought alloys of lead which comprises casting an alloy consisting essentially of from about 0.02% to about 0.1% by weight of calcium, tin in an amount such that the tin to calcium weight ratio or relative tin content is from about 7:1 to 10:1 and the absolute tin content is from about 0.3% to about 1.0% by weight, and the balance substantially lead; and cold working the casting at a time period of within about 24 hours after the casting thereof.

25. Cold worked lead-calcium-tin alloys produced by the process defined by claim 1 having a stable ultimate tensile strength at room temperature of at least about 6,000 psi., a stable stress-to-rupture life at room temperature of at least 25 hours at a stress level of 3,000 psi., and a stable, fine grained, worked, non-recrystallized microstructure at room temperature.

3,953,245

PROCESS FOR THE PRODUCTION OF DRAWING STEEL

Paul L. Jackson, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 793,884, Jan. 24, 1969, abandoned. This application Sept. 16, 1971, Ser. No. 181,210

Int. Cl.² C21C *7/06*

U.S. Cl. 148—3 **2 Claims**

1. A process for obtaining an improved yield of drawing quality non-rimmed carbon steel which is non-strain aging and which has a carbon content not substantially in excess of 0.07% comprising subjecting a ferrous melt effectively free of copper and tin impurities to the action of an oxidizing ambient until the carbon content of the melt has been reduced to not over 0.07% and the silicon content to not over 0.02%, said melt having a nitrogen content of at least 0.002%, isolating the ferrous melt so treated from the oxidizing ambient, establishing a manganese content in the melt to neutralize the adverse effects of any residual sulfur, adding sufficient silicon to yield a dissolved silicon content of at least 0.07% to the melt to act in synergism with the manganese content of the melt to establish an oxygen content of the melt of from about 0.01% to 0.03%, and subjecting an ingot solified from said melt to a subcritical anneal followed by slow cooling at a rate programmed to avoid carbon strain aging, the resulting ingot being characterized by an aging index no greater than 5%.

3,953,246

GOLD DIFFUSION PROCESS AND SHAPED METAL ARTICLES THEREBY

Robert Wilson, Dundee, and James Ramsay, Carnoustie, both of Scotland, assignors to Timex Corporation, Waterbury, Conn.

Filed Nov. 14, 1974, Ser. No. 521,610

Int. Cl.² C22F *1/08*

U.S. Cl. 148—11.5 R **17 Claims**

10. A process of producing a shaped copper alloy body which comprises the step of shaping a heated hardenable copper alloy in the unhardened condition to the desired con-

figuration, heating said heat hardenable copper alloy to a temperature of from about 700°C to 900°C for about 2 to about 30 minutes and thereafter quenching said shaped metallic body thereby hardening said body and forming a fine-grained eutecoid or duplex phase and an alpha-crystalline phase structure, then coating at least a portion of the thus formed hardened shaped body with a metal selected from the group consisting of gold and gold alloys and being capable of forming a heat diffusion coating on said shaped metallic copper alloy body when subjected to diffusion causing heat treatment, thereafter heating said coated body to a temperature of from 400°C to about 900°C for a period of from less than one minute to 30 minutes thereby diffusing said gold coating into said shaped copper alloy body.

3,953,247

METHOD FOR HEAT TREATMENT OF MATERIAL TO BE WORKED ON, ESPECIALLY OF ALUMINIUM OR MAGNESIUM ALLOYS

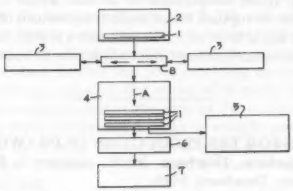
Friedrich Wilhelm Elhaus, Wuppertal, Germany, and Bernhard Hilge, Adliswil, Switzerland, assignors to Prolizenz AG and Friedrich Wilhelm Elhaus, Chur, both of, Switzerland

Filed Nov. 20, 1973, Ser. No. 417,509

Claims priority, application Germany, Nov. 21, 1972, 2256978; Oct. 3, 1973, 2349765

Int. Cl.² C22F 1/04, 1/06

U.S. Cl. 148—13 **12 Claims**



1. In a method for heat treating metal pieces comprising aluminum or magnesium alloys in the form of ingots, rods, tubes, strips or billets, the heat treatment being of the type wherein the metal piece is subjected to a preheat cycle in a preheat apparatus followed by a heat treatment cycle in a heat treatment apparatus separate from and independent of said preheat apparatus, and subsequent cooling,

the steps comprising:

preheating said metal piece in said preheat apparatus during the preheat cycle, by direct flame impingement, whereby a rapid preheating of the metal piece may be accomplished; and thereafter

transferring it to said heat treatment apparatus, and subsequently

maintaining said preheated metal piece at a desired heat treatment temperature in said heat treatment apparatus, during the heat treatment cycle,

the speed of the metal piece, if any, through each apparatus being independently adjustable, and adjusting the speed through each apparatus.

3,953,248

METHOD AND APPARATUS FOR RECLAIMING HEAT TREATING SALT

Lester Coch, Northport, N.Y., assignor to Waldes Kohinoor, Inc., Long Island City, N.Y.

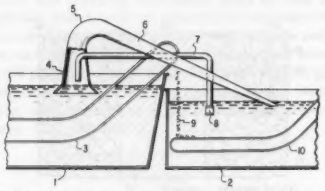
Filed Jan. 14, 1975, Ser. No. 540,867

Claims priority, application Germany, Jan. 7, 1975, 2500322

Int. Cl.² C21D 1/48

U.S. Cl. 148—15 **5 Claims**

1. In a process for reclaiming heat treating salt from the rinsing zone of a heat treating unit wherein metal parts are treated in a hot molten treating bath consisting essentially of molten, substantially anhydrous, water soluble heat treating salt in a treating zone and then rinsed in an aqueous liquid bath in a rinsing zone, the improvement which comprises transferring the aqueous liquid after contamination by entrained salt from the rinsing zone to an enclosed distillation zone within the treating zone which distillation zone has an open lower end extending into said hot molten salt bath below the surface thereof in said treating zone, maintaining said



molten salt bath at a temperature higher than the boiling point of said aqueous liquid whereby water contained in said aqueous liquid transferred to said distillation zone is evaporated at or above the surface of said salt bath therein and the salt contained in said aqueous liquid remains behind in said distillation zone and is commingled with said molten salt bath therein, and conducting the evaporated water fraction from said distillation zone to said rinsing zone for replenishing the aqueous bath therein.

3,953,249

COPPER BASE ALLOY

Michael J. Pryor; Jacob Crane, both of Woodbridge; Sam Friedman, and Eugene Shapiro, both of Hamden, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed July 11, 1974, Ser. No. 487,433

Int. Cl.² C22C 9/06

U.S. Cl. 148—32.5 **7 Claims**

1. A wrought copper base alloy in the cold rolled, aged and cold rolled condition consisting essentially of nickel from 7 to 14%, tin from 1.5 to 3.3%, wherein the minimum nickel plus tin content must be 9.5%, a material selected from the group consisting of iron from 0.1 to 3%, cobalt from 0.1 to 3% and mixtures thereof, wherein the minimum iron plus cobalt content must be 1.5%, balance essentially copper, wherein the microstructure of the alloy is characterized by the presence of a fine dispersed magnetic phase containing said material selected from the groups consisting of iron, cobalt and mixtures thereof, said alloy having a fine grain size below 0.025 mm.

3,953,250

METHOD FOR PRODUCING WIRE WITH A SMALL CROSS-SECTIONAL AREA

David I. Golland, Cary; Bernhard T. Junker, Raleigh; Gary E. O'Connor, Raleigh, and Charles J. Runkle, Raleigh, all of N.C., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 30, 1974, Ser. No. 519,364

Int. Cl.² B21C 37/04; C22C 29/00

U.S. Cl. 148—36 **20 Claims**

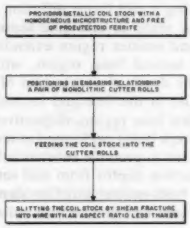
1. A method for producing wire with a small cross-sectional area and good mechanical properties by slitting steel strip wherein said slitting is characterized by an extended knife life, comprising the steps of:

a. providing blackplate coil stock with a homogeneous microstructure, an essentially uniform cross-section and substantially free of proeutectoid ferrite;

b. positioning in engaging relationship a pair of monolithic cutting rolls;

c. feeding said stock into the nip formed by said cutting rolls; and

d. slitting said stock by shear fracture into wire having an aspect ratio of less than about 25 to 1.


PROVIDING METALLIC COIL STOCK WITH A HOMOGENEOUS MICROSTRUCTURE AND FREE OF PROEUTECTOID FERRITE
POSITIONING IN ENGAGING RELATIONSHIP A PAIR OF MONOLITHIC CUTTER ROLLS
FEEDING THE COIL STOCK INTO THE CUTTER ROLLS
SLITTING THE COIL STOCK BY SHEAR FRACTURE INTO WIRE WITH AN ASPECT RATIO LESS THAN 25

15. A steel wire for reinforcing rubber articles, comprising: a cross-section having an aspect ratio less than 25 to 1, an essentially homogeneous microstructure substantially free of proeutectoid ferrite, a pair of slit edges and a small cross-sectional area.

3,953,251

METHOD FOR THE PRODUCTION OF CARBONYL IRON CONTAINING MAGNETIC DEVICES WITH SELECTED TEMPERATURE VARIATION

Alexander Duane Butherus, Murray Hill, and Milton Everett Terry, Mountainside, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1974, Ser. No. 454,152
Int. Cl.² H01F 1/02
U.S. Cl. 148—105 **8 Claims**

1. Method for the production of a ferromagnetic body exhibiting a predetermined temperature coefficient of magnetic permeability of value X, comprising:

a. compressing a quantity of a first particulate matter including at least 50 percent by weight of carbonyl iron powder, from 0.05 to 25 percent by weight of an insulator and from 1 to 25 percent by weight of an organic binder, to produce a first test body:

b. compressing a quantity of a second particulate matter including at least 50 percent by weight of carbonyl iron powder, from 0.05 to 25 percent by weight of an insulator and from 1 to 25 percent by weight of an organic binder, to produce a second test body;

c. measuring the value, Y, of the temperature coefficient of magnetic permeability of the first test body;

d. measuring the value, Z, of the temperature coefficient of magnetic permeability of the second test body, which said values, Y and Z, bracket the value, X;

e. mixing a first fractional portion by weight, A, of the first particulate matter with a second fractional portion, $(1-A)$, of the second particulate matter, wherein A is selected in accordance with the formula:

$$A = 0.7\,[(X-Y)/(Z-Y)] + 0.15;$$

where A is from 0.15 to 0.85; and

f. compressing a quantity of the mixed powder to produce the ferromagnetic body of temperature coefficient of magnetic permeability, X.

3,953,252

METHOD OF MANUFACTURING METAL ARTICLES HAVING MAGNETIC AND NON-MAGNETIC AREAS

Felix Lvovich Levin, Novo-Khoroshevskoe shosse, 26 korpus 3, kv. 29; Sergei Alexandrovich Golovanenko, 9 Parkovaya ulitsa, 57, korpus 3-a, kv. 12, and Vladimir Alexandrovich Dmitriev, ulitsa Plekhanova, 3, korpus 5, kv. 73, all of Moscow, U.S.S.R.

Continuation of Ser. No. 365,177, May 30, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,663
Int. Cl.² H01F 1/00
U.S. Cl. 148—121 **12 Claims**

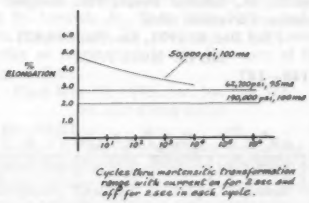
1. A method of manufacturing an integral steel article having magnetic and non-magnetic areas comprising the steps of: selecting a steel article comprising, by weight, not more than 0.1% carbon, 7–12% manganese, 11–30% chromium and the balance being iron; heating areas of the steel article intended to form a non-magnetic structure to a temperature of from 450°–1000° C; soaking the areas; and cooling the areas to form a non-magnetic structure in the areas; heating areas of the steel article intended to form a magnetic structure to a temperature of from 1000° C to the melting point of the steel; soaking the areas to form a magnetic structure in the areas; and cooling the areas having the magnetic structure at a rate to prevent the formation of the non-magnetic structure.

3,953,253

ANNEALING OF NITI MARTENSITIC MEMORY ALLOYS AND PRODUCT PRODUCED THEREBY

Joel P. Clark, Plainville, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 21, 1973, Ser. No. 427,164
Int. Cl.² C22F 1/10
U.S. Cl. 148—131 **6 Claims**

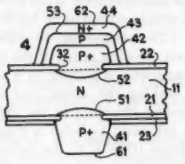


1. A process for increasing the tensile strength of a selected martensitic alloy of titanium and nickel and improving the alloy's cyclic creep resistance by stabilizing it against progressive elongation when cycled through successive martensitic transformations, said alloy having a martensitic transformation temperature range and a first diffusional phase transformation temperature constituting the first temperature above said martensitic transformation range at which there is a negative slope in the electrical resistivity versus temperature curve for said alloy, said first diffusional phase transformation temperature being in the range from about 300° to 500°C., the process comprising maintaining said alloy under a tensile stress of between about 30,000 and 100,000 psi while heating the alloy at a temperature above said first diffusional phase transformation temperature to anneal said alloy for substantially increasing the tensile strength thereof.

3,953,254
METHOD OF PRODUCING TEMPERATURE COMPENSATED REFERENCE DIODES UTILIZING SELECTIVE EPITAXIAL GROWTH

Henri Valdman, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 413,384, Nov. 6, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,800
Claims priority, application France, Nov. 7, 1972, 72.39350
Int. Cl.² H01L *21/20, 23/56, 29/90*
U.S. Cl. 148—175 **3 Claims**



1. A method of manufacturing a thermally compensated reference diode, comprising the following steps:

— the formation upon one face of a monocrystalline semiconductor substrate, of a relief button of monocrystalline semiconductor material, by selectively growing an epitaxial region of the opposite conductivity type to that of the substrate;

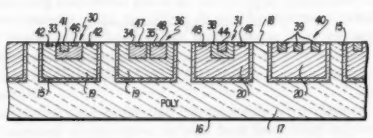
— the formation, upon that surface of the semiconductor substrate which is opposite to that of the first button, of a second relief button of monocrystalline semiconductor material, by selectively growing an epitaxial region of the opposite conductivity type to that of the substate;

— the formation on the second button of a monocrystalline semiconductor film having the same conductivity type as the substate by epitaxial growth.

3,953,255
FABRICATION OF MATCHED COMPLEMENTARY TRANSISTORS IN INTEGRATED CIRCUITS

Clyde Combs, Jr., Satellite Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 6, 1971, Ser. No. 204,821
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **16 Claims**



1. A process for providing matched complementary transistors in an integrated circuit, which comprises:

partially diffusing a first impurity of one conductivity-determining type into a first collector region of opposite conductivity type extending to a major planar surface of a body of single crystal material to form a first base region extending to said surface within said first collector region, said first impurity having a relatively slow diffusion coefficient in said single crystal material,

partially diffusing a second impurity of said opposite conductivity-determing type having a relatively faster diffusion coefficient in said crystal material into a second collector region of said one conductivity type extending to said surface and spaced apart from said first collector region along said surface of said body to form a second base region extending to said surface within said second collector region, while simultaneously increasing the depth of penetration of said first impurity in said first collector region,

partially diffusing another portion of said second impurity into said first region to form a first emitter region extending to said surface within said first base region, while simultaneously increasing the depth of penetration of said first and second impurities in the first and second collector regions, respectively, and

diffusing a third impurity of said one conductivitydetermining type having a still faster diffusion coefficient in said single crystal material into said second base region to form a second emitter region extending to said surface within said second base region, while simultaneously increasing the depth of penetration of said first and second impurities in the first and second collector regions and in the first base region, respectively,

said diffusing steps being performed at temperatures and for times sufficient to produce substantially equal final base-collector junction depths from said surface, and substantially equal base-emitter junction depths from said surface, within said first and second collector regions.

3,953,256
PROPELLANTS AND PYROTECHNIC COMPOSITIONS CONTAINING ALUMINUM-COATED AMMONIUM PERCHLORATE

William W. Schwarz, and William D. Stephens, both of Huntsville, Ala., assignors to Thiokol Corporation, Newtown, Pa.

Filed Aug. 22, 1973, Ser. No. 390,455
Int. Cl.² C06B *45/34*
U.S. Cl. 149—5 **2 Claims**

1. In a pyrotechnic composition comprising aluminum metal, ammonium perchlorate and a binder, the improvement which comprises replacing at least 5% of said ammonium perchlorate with aluminum-coated ammonium perchlorate.

3,953,257
METHOD FOR PREPARING SMALL PARTICLE SIZE COATED AMMONIUM PERCHLORATE

Orval E. Ayers; Hiram W. H. Dykes, and Bernard J. Alley, all of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

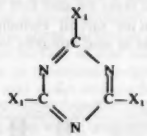
Filed Sept. 7, 1973, Ser. No. 394,889
Int. Cl.² C06B *45/34*
U.S. Cl. 149—7 **6 Claims**

1. A method for preparing ultrafine particle size ammonium perchlorate that has weight median diameters ranging from about 0.25 to about 5.0 micrometers and that is coated with an aziridine compound, said method comprising:

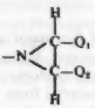
i. charging a predetermined amount of unground ammonium perchlorate into a vibro-energy grinding mill;

ii. adding to said mill a predetermined amount of a trichlorotrifluoroethane solution of a high purity aziridine compound selected from the aziridine compounds represented by the following structures:

STRUCTURE I

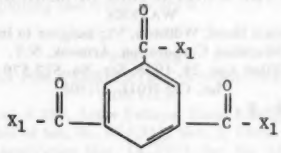


wherein X_1 is an aziridine group:



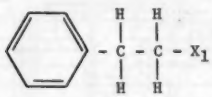
and Q_1 and Q_2 are either hydrogen or alkyl groups of one to four carbon atoms,

STRUCTURE II



wherein X_1 is as described for Structure I, and

STRUCTURE III



wherein X1 is as described for Structure I;

iii. operating said mill for a predetermined period of time ranging from about one hour to about 72 hours to form an ammonium perchlorate slurry;

iv. discharging said ammonium perchlorate slurry from said mill; and,

v. drying said discharged ammonium perchlorate slurry at a temperature ranging from about 120°F to 160°F for a period of time of up to about 3 days to yield an ammonium perchlorate product with a uniform coating of said aziridine compound.

3,953,258

POLYNITROAMINE OXIDIZER CONTAINING PROPELLANT

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 6, 1970, Ser. No. 56,016
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.3 **4 Claims**

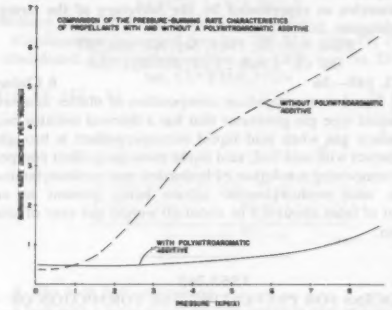
1. A propellant composition comprising the oxidizer bis(-trinitroethyl)nitroamine; a binder comprised of ethyl acrylate-acrylic acid copolymer in combination with 1,2,3-tris[1,2-bis(difluoramino)epoxy] propane; and dicyclo diepoxy carboxylate curing agent.

3,953,259

PRESSURE EXPONENT SUPPRESSANTS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 1, 1970, Ser. No. 78,332
Int. Cl.² C06B *45/10, 45/18, 25/34, 25/4*
U.S. Cl. 149—19.5 **10 Claims**


COMPARISON OF THE PRESSURE-BURNING RATE CHARACTERISTICS OF PROPELLANTS WITH AND WITHOUT A POLYNITROAROMATIC ADDITIVE
WITHOUT POLYNITROAROMATIC ADDITIVE
WITH POLYNITROAROMATIC ADDITIVE

1. A propellant composition comprising; a binder present in an amount of about 4 to about 20 weight percent, an oxidizer present in an amount of about 50 to about 80 weight percent, a pressure exponent suppressant selected from the group consisting of hexanitrostilbene, triaminotrinitrobenzene, picric acid and the ammonium salt of picric acid and a curing agent, said pressure exponent suppressant being present in an amount of about 1 to about 20 weight percent of the propellant composition.

3,953,260

GOSSYPOL, AN ABUNDANT, LOW-COST IRON DEACTIVATOR, POT-LIFE EXTENDER, AND PROCESSING AID FOR HTPB PROPELLANTS

John D. Braun; M. Frank Pickett, both of Ridgecrest, Calif.; Howard W. Gerrish, Jr., Twin Falls, Idaho, and Hans B. Jonassen, New Orleans, La., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 23, 1975, Ser. No. 580,385
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.92 **7 Claims**

1. In a method for mixing propellants comprising the steps of mixing solid particles with a hydroxy terminated polymeric binder, adding an isocyanate curative, working the resulting mixture into a suitable container and allowing it to cure, the improvement residing in adding gossypol to the mix to increase its pot life.

3,953,261

LIQUID MONOPROPELLANT COMPOSITIONS INCLUDING HYDRAZINE AND METHOXYLAMINE HYDROCHLORIDE

William A. Duncan, Huntsville; John F. Phillips, Florence; James A. Murfree, Jr., and Walter W. Wharton, both of Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 18, 1969, Ser. No. 834,618
Int. Cl.² C06D *5/10*
U.S. Cl. 149—36 **4 Claims**

1. A liquid monopropellant composition of matter adapted for a liquid type gas generator that has a thermal bed to produce gas, said liquid monopropellant composition comprising a solution of hydrazine and methoxylamine hydrochloride,

said methoxylamine hydrochloride being present in an amount of about 10 to about 35 weight percent.

3,953,262

MONOPROPELLANT COMPOSITION COMPRISING HYDRAZINE AND METHOXYLAMINE NITRATE

William A. Duncan; James A. Murfree, Jr.; Pasquale Martignoni; Walter W. Wharton, all of Huntsville, and John F. Phillips, Florence, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 20, 1969, Ser. No. 886,597
Int. Cl.² C06B *25/34, 43/00, 47/08*
U.S. Cl. 149—36 **6 Claims**

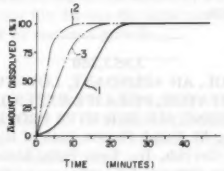
1. A liquid monopropellant composition of matter adapted for a liquid type gas generator that has a thermal initiator bed to produce gas when said liquid monopropellant is brought into contact with said bed, said liquid monopropellant composition comprising a solution of hydrazine and methoxylamine nitrate, said methoxylamine nitrate being present in an amount of from about 0.5 to about 40 weight per cent of said solution.

3,953,263

PROCESS FOR PREVENTING THE FORMATION OF NITROGEN MONOXIDE IN TREATMENT OF METALS WITH NITRIC ACID OR MIXED ACID

Misao Ishikawa, Chosei; Rokuro Tsuji, Chiba, and Norihisa Yoshimori, Mobara, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 26, 1973, Ser. No. 418,907
Int. Cl.² C23F *1/00, 1/02*
U.S. Cl. 156—7 **5 Claims**



1. In a process for dissolving a molybdenum core from a coil heater by dipping said coil heater in a resolving solution containing nitric acid and water as main components, said coil heater being prepared by winding tungsten wire around said molybdenum core, applying an alumina insulator onto the tungsten wire and sintering the applied alumina insulator, the improvement comprising adding sufficient ammonium peroxodisulfate to said resolving solution so that the formation of nitrogen monoxide during dissolution of the molybdenum core is prevented.

3,953,264

INTEGRATED HEATER ELEMENT ARRAY AND FABRICATION METHOD

Leon L. Wu, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1974, Ser. No. 501,567
Int. Cl.² H01L *21/22, 21/306*
U.S. Cl. 156—7 **11 Claims**

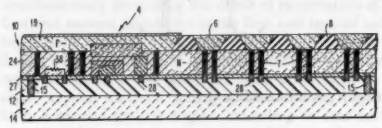
1. A method for fabricating a matrix of heating mesas in a semiconductor substrate, the area of the surface of the mesas opposite said substrate being larger than the area contiguous to said substrate, comprising the steps of:

forming a matrix of trenches in a first major surface of said substrate, the bottom of said trenches having an area which is smaller than the area at the upper surface of the substrate;

filling said trenches with a material which is soluble in a solvent in which said substrate is substantially insoluble;

forming an epitaxial layer on said first major surface;

forming semiconductor circuit elements associated with said heating mesas in said epitaxial layer,



removing a portion of the major surface of said substrate opposite said first major surface so as to expose said soluble material at the bottoms of said trenches; and

etching said soluble material from said trenches;

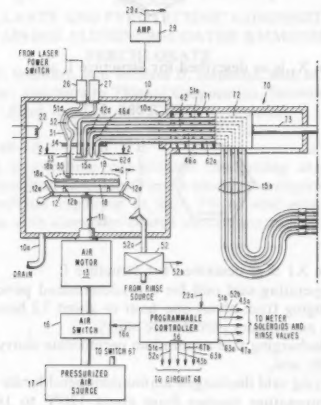
whereby the semiconductor substrate regions defining said trenches are in the desired shape.

3,953,265

MENISCUS-CONTAINED METHOD OF HANDLING FLUIDS IN THE MANUFACTURE OF SEMICONDUCTOR WAFERS

Roderic Kermit Hood, Williston, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,570
Int. Cl.² H01L *21/308*
U.S. Cl. 156—8 **8 Claims**



8. A method of greatly reducing the amount of corrosive operating fluids used in the course of manufacturing integrated circuits at each of plural stages in the manufacture of an integrated circuit in which at each stage an oxide or metal layer is deposited with a photoresist layer being applied thereover and a shape-determining image thereon, comprising the steps of

supporting said wafer in a processing chamber in a horizontal position on a platform which can be rapidly rotated with said wafer, the photoresist layer being on the top side of said wafer,

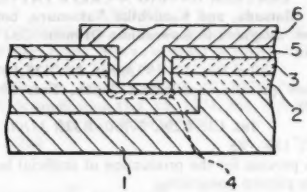
firstly metering a predetermined volume of photoresist developing solution onto the upper surface of said wafer to form a meniscus-contained fluid body over the entire upper surface of said wafer while said wafer and platform are in a stationary state,

firstly statically maintaining said platform and wafer which the meniscus-contained body of developer fluid until the end of a development period,

firstly rotating said supporting platform with said wafer to remove the body of the developing fluid, and
firstly spraying said wafer with a washing solution,
secondly metering a predetermined volume of an etchant solution onto the upper surface of said wafer to flow over the entire upper surface of said wafer to all edges of said wafer to form a meniscus-contained body of etchant solution while said wafer and platform are in a stationary state,
secondly rotating said wafer immediately upon the completion of etching to rapidly terminate the etching operation, and
secondly spraying said wafer with a washing solution,
thirdly metering a predtermined volume of photoresist stripping solution onto the upper surface of said wafer to flow over the entire upper surface to all edges of said wafer to form a meniscus-contained body of stripping solution while said wafer and platform are in a stationary state,
thirdly statically maintaining said meniscus-contained body of stripping fluid until the stripping process is completed,
thirdly rotating said wafer upon the completion of said stripping step to remove the stripping solution from said wafer,
thirdly spraying said wafer with a wash solution, and
thirdly spinning said wafer to dry it.

3,953,266
PROCESS FOR FABRICATING A SEMICONDUCTOR DEVICE

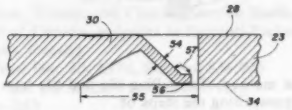
Toshio Takai, 6,269, Ayase Fukaya, Koza, Kanagawa, Japan
Continuation of Ser. No. 874,317, Nov. 5, 1969, abandoned. This application Mar. 15, 1973, Ser. No. 341,757
Claims priority, application Japan, Nov. 28, 1968, 43-87122
Int. Cl.² H05K *3/06, 3/16*
U.S. Cl. 156—11 **8 Claims**



1. A process for producing a semiconductor composite comprising the steps of:
a. providing a semiconductor substrate having on a surface portion thereof a layer of platinum formed on a layer of a titanium;
b. masking said platinum layer with a mask layer of chromium;
c. masking a portion of said chromium mask layer with a layer of photoresist patterned in accordance with a predetermined pattern;
d. selectively etching away only the non-masked portion of said chromium mask layer so that the masked portion of said chromium mask layer remains on said platinum layer;
e. then, selectively etching away only the portion of said platinum layer not masked by the chromium mask layer remaining on the platinum layer, so that the mask portion of said platinum layer remains on said titanium layer;
f. completely removing said photoresist mask layer subsequent to the aforesaid step (d);
g. completely removing said chromium mask layer remaining on said platinum layer subsequent to the removal of the photoresist layer;
h. forming a layer of gold on said portion of said platinum layer remaining on said titanium layer by gold-electroplating;
i. forming a gold beam lead on said gold layer by gold-electroplating, and then
j. selectively etching away said titanium layer in accordance with the pattern of said gold layer on said platinum layer.

3,953,267
SAFETY LOCK BOLT

Wilford Flynn, R.R. 6, Bedford, Ind. 47421
Continuation-in-part of Ser. No. 380,812, July 19, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,473
Int. Cl.² F16B *39/24*
U.S. Cl. 151—13 **14 Claims**



5. The lock bolt comprising:
a bolt with a headed end and an opposite end and including a shank with external threads, such shank having a longitudinal axis with a slot interrupting said threads and extending in the direction of said axis to said opposite end;
a first washer having a main body with thickness and extending continuously around said longitudinal axis with said main body including an inner circumferential edge and an outer circumferential edge, said washer having a hole through which said shank extends with said first washer including a first lug extending inwardly from said inner circumferential edge into said hole and into said slot preventing axial movement between said shank and said washer, said washer further including a plurality of leaf springs mounted thereon, said leaf springs being positioned completely between said outer circumferential edge and said inner circumferential edge, each of said springs having a proximal end integrally attached to said first washer and a free distal end with said spring projecting toward said opposite end of said shank, said main body having a first side with said springs projecting through said first side when extended and not depressed into said main body, said main body having a second side opposite said first side, each of said springs sized relative to said main body to be contained completely in said main body between said first side and said second side and to not project through said first side and said second side when completely depressed within said main body;
a nut threadedly mounted on said shank having a surface with multiple recesses formed thereon facing said first washer and receiving said springs in said recesses;
each spring has a center portion between said distal end and said proximal end positioned closer to said proximal end than said distal end preventing said distal end from first contacting said nut, said springs are yieldable and will depress as said nut is tightened and will snap into said recesses locking said nut to said first washer, said center portion contacting said nut when said nut is loosened depressing said springs and avoiding contact and interference between said distal end of each spring and said nut, each of said springs extend from said proximal ends to said distal ends around said longitudinal axis in the same direction;
each of said springs includes a thickness less than said thickness of said main body to not project through said second side when fully depressed into said main body;
said distal end of each spring includes a portion parallel with said second side only when said springs are fully depressed into said main body.

3,953,268

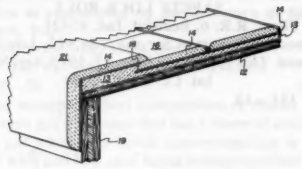
METHOD OF INSTALLING TILE AND TILE TRIM ON A CABINET SURFACE

Elmer D. Dillon, 8775 Troy St., Spring Valley, Calif. 92077

Filed Jan. 2, 1974, Ser. No. 429,761

Int. Cl.² B32B *1/04, 3/02;* E04F *13/00;* E04C *2/08*

U.S. Cl. 156—71 1 Claim



1. The method of installing tile and tile trim on a cabinet surface comprising the steps of:

applying a filler coating on a cabinet surface;

applying an adhesive coating on said filler coating;

applying tile strips untrimmed as to length to the adhesive coating;

adding filler in any space between the terminating edge of the tile strips and a corner of the cabinet; and

cementing a strip of corner trim to the front corner of said cabinet, said corner trim having first and second inside surfaces angled for cooperation with and overlapping the corner of said cabinet, with one of said first and second surfaces being cemented to the top surface of the tile the strip adjacent to said corner strip, and overlapping the end of said tile strip.

3,953,269

METHOD OF MAKING COMPOSITE FABRIC

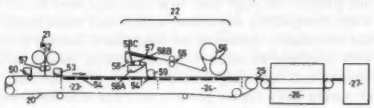
David Stewart Queen, Sanquhar; Peter William Bell, Beith; Thomas Hutcheson Dick, Dundee, and John Black Edgar, Giffnock, all of United Kingdom, assignors to Sidlaw Industries Limited, London, England

Filed Feb. 5, 1974, Ser. No. 439,931

Claims priority, application United Kingdom, Feb. 13, 1973, 6997/73

Int. Cl.² B32B *3/26*

U.S. Cl. 156—79 1 Claim



1. A method of manufacturing a composite fabric comprising the steps of forming a substrate material by applying a layer of fibrous material to a layer of deaerated thermoplastic material in liquid form and maintaining the viscosity of the thermoplastic material at a level to permit the fibrous material to sink into the layer of thermoplastic material, thermally threating the substrate material to achieve firm gellation of the thermoplastic material, coating one surface of a web of relatively lightweight material with a layer of a foamable plastic material in a liquid state, and applying said coated surface of the lightweight material to a surface of the gelled substrate material when in a heated state for a period sufficient to effect gellation of the foamable plastic material to bond the lightweight material to the substrate material and form the composite fabric.

3,953,270

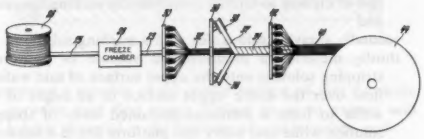
MANUFACTURE OF REINFORCED ELASTOMERIC HOSE

Gary P. Ford, Trotwood, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 5, 1974, Ser. No. 520,984

Int. Cl.² B24B *3/00*

U.S. Cl. 156—80 3 Claims



1. Method of making reinforced elastomeric high pressure hose comprising the steps of:

extruding a layer of an uncured elastomer over a flexible mandrel coextensively therewith,

freezing at least a portion of said layer,

tightly applying a textile reinforcing layer over said portion while it is frozen to prevent further extrusion of said layer, said textile layer being applied with sufficient pressure to cause further extrusion of said layer in its unfrozen condition, and

sequentially applying additional elastomeric and reinforcing textile layers, curing the uncured elastomeric layers and removing said mandrel.

3,953,271

PROCESS FOR THE PRODUCTION OF ARTIFICIAL LEATHER HAVING A CREPE PATTERN

Yujiro Matsuda, and Kazuchika Nakamura, both of Kyoto, Japan, assignors to Kawashima Orimono Co., Ltd., Kyoto, Japan

Filed Dec. 17, 1973, Ser. No. 425,127

Claims priority, application Japan, Dec. 20, 1972, 47-127969

Int. Cl.² B29C *27/00;* B32B *31/00*

U.S. Cl. 156—85 2 Claims

1. A process for the production of artificial leather having a crepe pattern comprising:

preparing a woven fabric base cloth material which is composed of highly heat shrinkable yarn and less heat shrinkable yarn,

said highly heat shrinkable yarn being interwoven with said less heat shrinkable yarn in a predetermined woven pattern,

said highly heat shrinkable yarn having a heat shrinkage rate of at least 10 percent at a temperature within the range at 80° to 230°C. and the difference in the heat shrinkage rate between said highly heat shrinkble yarn and said less heat shrinkable yarn being at least 5 percent within the aforesaid temperature range,

forming a synthetic resin film layer having a thickness within the range of 10 to 150 microns directly on and integral with the surface of said woven fabric base cloth material to obtain an artificial leather material having a smooth synthetic resin surface, and

subjecting said artificial leather material to a heat treatment to thereby form a predetermined crepe pattern on said synthetic resin film layer due to the heat shrinkage difference between said highly heat shrinkable yarn and said less heat shrinkable yarn of said woven fabric base cloth material,

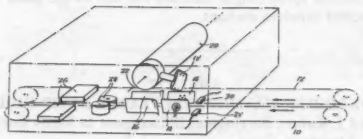
said crepe pattern corresponding identically to said predetermined woven pattern in said base cloth material.

3,953,272

PROCESS FOR END SEALING A BAG AND APPARATUS THEREFOR

Geoffrey Terence Webber, Bristol, England, assignor to Whitehall Machinery Limited, Bristol, England

Filed May 15, 1974, Ser. No. 470,293
Claims priority, application United Kingdom, May 16, 1973, 23438/73
Int. Cl.² B32B *31/20*
U.S. Cl. 156—152 7 Claims



6. A continuous method for heat sealing the mouths of sacks comprising the steps of:

transporting each sack along a path with opposite sides at the mouth of each sack drawn together in superimposed relationship, the mouth having a leading fold, sides and a trailing fold;

drawing the sides of the sack apart at the mouth by suction means located on either side of the path;

moving a nozzle into and then out of the open mouth of the sack in passing, and directing heated gas from the nozzle into the leading fold of the sack mouth as the nozzle enters, onto the sides of the sack mouth while the nozzle remains stationary therein, and then into the trailing fold of the sack mouth as the nozzle is removed therefrom; and

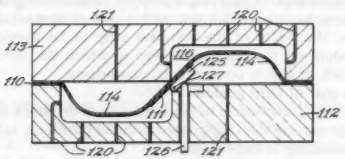
pressing the thus heated surfaces together to effect the heat-seal.

3,953,273

PROCESS FOR FORMING VISUAL DISPLAY PACKAGES

Rudolph A. Faller, Edina, Minn., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Division of Ser. No. 451,019, March 14, 1974, Pat. No. 3,920,371. This application Oct. 15, 1974, Ser. No. 514,498
Int. Cl.² B29C *17/04*
U.S. Cl. 156—224 7 Claims



1. The method of forming a visual display container from a foldable packaging card blank having two window openings formed therein, said window openings disposed on either side of a rotatable platform section formed in said card blank and positioned within said card blank adjacent to a transverse fold line, said platform section being adapted to become an exterior portion of said container, and having a plastic film spanning said window openings and said platform section, which comprises the steps of:

locating at least one of said card blanks on a first platen having formed therein an opening of size and shape conforming to a first of said window openings in said card blank, and located adjacent thereto on one side of said card blank;

moving a second platen into registry with said first platen and the other side of said card blank, said second platen having formed therein an opening of size and shape similar to the second of said window openings in said card blank, and located adjacent thereto;

forming a recess pocket in said plastic film extending through each of said window openings in said card blank into said respective openings in said first and second platens and into conforming shape with a pocket-forming region located adjacent to said openings in said first platen and said second platen; and

rotating said rotatable platform section in said card blank into position on the exterior of the recessed pocket formed in said film through said first window opening in said card blank.

3,953,274

MAGNETICALLY ACTUABLE ELEMENT AND METHOD OF MAKING

Donald Winrow, Weston, and Charles Norman Smith, Mississauga, both of Canada, assignors to Ferranti-Packard Limited, Toronto, Canada

Filed Dec. 23, 1974, Ser. No. 536,925
Int. Cl.² B32B *31/00*; B65C *9/25*
U.S. Cl. 156—252 7 Claims

1. In the method of constructing a plurality of laminar magnet-bearing elements, the steps of:

providing a middle tape approximately the desired thickness, in one dimension, of said element,

creating a plurality of magnet apertures in said tape, longitudinally spaced, along said tape,

each of said apertures being located more than a predetermined distance from at least one edge of said tape,

creating cut-outs in said tape within said predetermined distance from said at least one edge in a predetermined orientation and spacing from said magnet apertures,

after the creation of such apertures and cut-outs, causing first outer tape to adhere to one side of said middle tape, covering said apertures on said one side but leaving exposed at least a portion of said cut-outs,

thereafter placing magnets in said apertures, each in an orientation to have its magnetic axis in a predetermined orientation relative to the longitudinal extension direction of said tapes, said megnets being selected to have an axis of magnetization with a component in the plane of the tape and a thickness approximately that of the middle tape,

thereafter, causing second outer tape to adhere to the other side of said middle tape, overlying said magnets and magnet aperture and leaving exposed on said other side, at least a portion of said cut-outs.

3,953,275

METHOD AND APPARATUS FOR LIQUID ADHESIVE APPLICATION

David L. Henderson, O'Fallon, and Joseph R. Hickman, Webster Groves, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Jan. 30, 1975, Ser. No. 545,399
Int. Cl.² B05C *1/00*; B32B *31/00*
U.S. Cl. 156—278 16 Claims

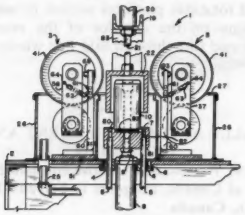
15. A process for producing a stator core, comprising:

measuring a stack of individual laminations forming said core, said laminations each having inwardly radially extending teeth and yoke sections radially outboard of said teeth, edges of said teeth and said yoke sections defining

inner and outer surfaces, respectively, of the stack formed by said laminations, said stack of laminations having a longitudinal axis;

applying to the stack of laminations of predetermined axially compressive force;

moving said stack of laminations reciprocally along said longitudinal axis while maintaining said axial compressive force on said laminations;



applying a liquid adhesive to the outer surface of the lamination stack from at least one, porous roller applicator;

rotating said porous roller applicator as said stack of laminations moves along said longitudinal axis, said roller applicator being adapted to abut the outer surface of said lamination stack during movement of the stack;

squaring said stack and clamping the square stack under a predetermined axial pressure; and

curing said adhesive.

3,953,276

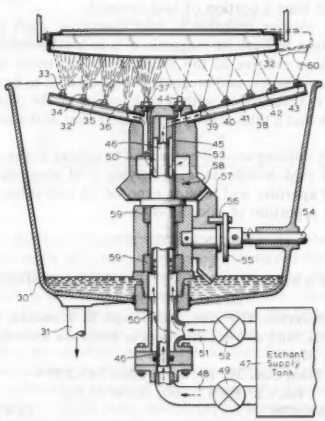
ETCHING APPARATUS WITH PLURAL NOZZLE ARRANGEMENTS

Edward J. Glorioso, Downers Grove, and Martin L. Lerner, River Forest, both of Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

Continuation of Ser. No. 301,033, Oct. 26, 1972, abandoned. This application Apr. 19, 1974, Ser. No. 462,277

Int. Cl.² C23F 1/02

U.S. Cl. 156—345 **9 Claims**



1. An apparatus for re-etching the apertures of different size shadow masks to be used in color cathode-ray tubes having faceplate panel sections of corresponding different sizes, which apparatus comprises:

a source of etchant material for attacking such shadow masks;

a plurality of etchant supply means;

a corresponding plurality of sets of etchant supply arms, each arm in a set of arms having an effective spray length for spraying masks of one particular size;

means for connecting each of said supply means individually to a set of etchant supply arms; and

selector means for connecting, at any given instant, only one of said supply means to said source of etchant material so that only the set of etchant supply arms whose effective spray length matches the size of the mask to be etched receives etchant.

3,953,277

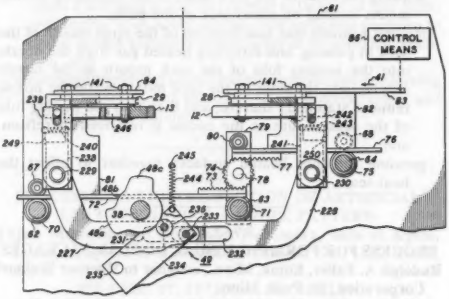
BOOKBINDER HAVING RESETTABLE STRIP GUIDES

Richard J. Kuhns, Barrington, Ill., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,839

Int. Cl.² B42C 13/00, 19/00

U.S. Cl. 156—360 **8 Claims**



1. Apparatus for applying a piece of adhesive strip to a stack of sheets having a thickness within one of several thickness ranges, the width of the adhesive strip to be applied being dependent on the thickness range to which the thickness of the stack of sheets corresponds, comprising:

a. a pair of strip guides;

b. means, responsive to the thickness of the stack of sheets, for moving the strip guides to initial positions, said means including linkage means;

c. bipartite clamping means;

d. means, coupled to the linkage means, for moving the clamping means into engagement with the stack of sheets and for stressing play out of said linkage means, thereby moving the strip guides into one of a set of several sets of positions, each set corresponding to one of the thickness ranges, said one of a set of positions being suitable for supporting an adhesive strip having a width which is suitable for binding the engaged stack of sheets;

e. an arrangement of platens;

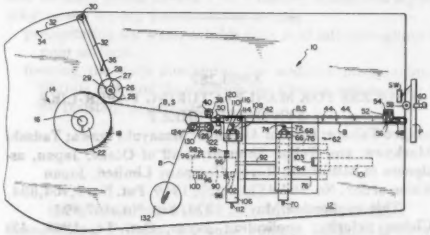
f. means for rotating the clamping means, thereby moving an edge of the clamped stack of sheets into abutment with one side of the adhesive strip and for moving the other side of the adhesive strip into abutment with at least one of the platens; and

g. means for biasing the platens against the other side of the strip to fix the strip to the stack of sheets, thereby forming a book.

3,953,278
STICKER APPLICATOR

Gary L. Smith, Hickory, and Walter T. Cockrell, Newton, both of N.C., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,719
Int. Cl.² B32B 31/00; B65N 5/28
U.S. Cl. 156—361 7 Claims



1. An applicator for applying a sticker or other material having an adhesive on at least one surface releasably mounted to a continuous backing strip to an object comprising:

support means;

guide means mounted to said support means for directing said strip from a source of supply along a first path past said object, said guide means causing said sticker to separate from said strip and travel a second path by abruptly changing the first path of said strip at said object, said object moving along a third path and said sticker in said second path intersects said object in said third path;

a take-up means mounted to said support means for reeling said backing strip after said stickers have been detached;

a stationary clamp means mounted to said support means between said abrupt change in said first path and said take-up means;

a mobile clamp means slidably mounted to said support means between said abrupt change in said first path and said take-up means for intermittently engaging said backing strip and drawing said backing strip past said abrupt change by reciprocal movement relative to said support means; and

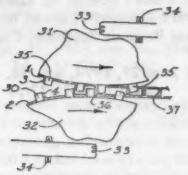
control means connected to said stationary and mobile clamp means for closing and advancing said mobile clamp means during the advance segment of said reciprocal movement and for closing said stationary clamp means during the return segment of said reciprocal movement to prevent said take-up means from drawing said backing strip.

3,953,279
APPARATUS FOR ASSEMBLING SPACED SHEETS TO FORM A PANEL STRUCTURE

William A. Wootten, 425 Via Corta, Malaga Cove Plaza, P.O. Box 98, Palos Verdes Estates, Calif. 90274

Division of Ser. No. 170,120, Aug. 9, 1971, Pat. No. 3,846,218.
This application Nov. 4, 1974, Ser. No. 521,005
Int. Cl.² B32B 31/00
U.S. Cl. 156—513 13 Claims

1. An apparatus for joining a pair of sheets comprising perforating means for cutting patterns of plural partial perforations in said sheets respectively, each partial perforation defining a tab area located substantially in the plane of said sheet and adapted to be bent out of the plane of said sheet about the unperforated portion of each partial perforation acting as a hinge line; means for applying an adhesive material to at least one of said sheets; means for transporting said partially perforated sheets in spaced relation to one another with the pattern of partial perforations in each sheet being in opposed relation to the pattern of partial perforations in the other of said sheets; and means for bending the tab areas defined by the partial perforations in said sheets through an angle of substantially 90° to the plane of each sheet in a direction extending toward the other of said sheets to cause corresponding pairs of said tabs extending from said two sheets

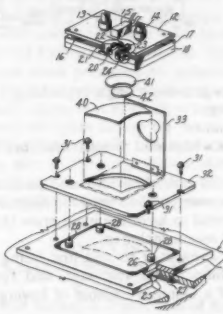


respectively to come into overlapping, planar engagement with one another in the region between said spaced sheets and to be bonded to one another by said adhesive material.

3,953,280
TEAR SEAL APPARATUS

Thomas G. Brophy, Gloucester; Douglas H. Crowell, West Gloucester, and John G. Hollick, Beverly, all of Mass., assignors to USM Corporation, Boston, Mass.

Filed Apr. 30, 1974, Ser. No. 465,608
Int. Cl.² B30B 15/02, 15/34
U.S. Cl. 156—515 4 Claims



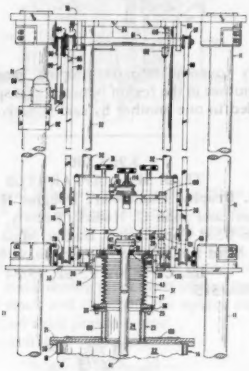
1. In apparatus for applying an applique of thermoplastic material to a workpiece wherein the applique is formed from a piece of material, heat sealed about its periphery and prebonded or tacked over its entire surface through the application of heat and pressure to provide an applique affixed to the workpiece for subsequent embossing, the combination of work table means and press means in opposed relation for applying pressure therebetween, workpiece positioning means disposed on said work table means for receiving and locating a workpiece of specific contour, applique positioning means overlying said workpiece positioning means for receiving and locating a piece of applique material of specific contour in contact with the workpiece, die means disposed on said press means for forming an applique and sealing said applique about its periphery only under predetermined conditions of temperature and pressure, said die means being located and aligned with said applique piece and having a resilient and compressible insert extending outwardly therefrom and beyond its cutting edge to permit initial contact with said applique material, means for applying pressure between said work table means and said press means and means for applying heat to said die means, said resilient and compressible insert extending beyond said cutting edge of said die to compress said applique on said workpiece and drive out any air pockets therebetween prior to full compression therewith.

3,953,281

METHOD AND SYSTEM FOR GROWING MONOCRYSTALLINE INGOTS

Anthony A. Pantusco, Newburgh, N.Y.; Warren J. Pinckney, New Fairfield, Conn.; George R. Santillo, Jr., Wappinger Falls, and Gerard J. Scharff, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 27, 1974, Ser. No. 483,511
Int. Cl.² B01J *17/18*
U.S. Cl. 156—618 18 Claims



1. A system for growing a single crystal ingot from a molten material including:

a furnace chamber;

support means within said furnace chamber for the molten material;

pull shaft means extending into said furnace chamber to support a monocrystalline seed for disposition within the molten material to have the ingot grow thereon;

said pull shaft means includes:

a first shaft connected to said first lifting means and in sealing contact with said seal, said first shaft being formed of a material capable of having precise tolerances;

a second shaft supporting the seed said second shaft having a higher thermal conductivity than said first shaft and being formed of a material capable of withstanding their temperatures in said furnace chamber without warping;

and means to connect said first and second shafts to each other;

said furnace chamber having heating means producing an optimum heating zone within said furnace chamber;

first lifting means to linearly lift said pull shaft means as the ingot grows from the molten material, said first lifting means includes a pair of raising and lowering means disposed on diametrically opposite sides of the longitudinal axis of said pull shaft means and exerting a resultant lifting force only along the longitudinal axis of said pull shaft means; second lifting means to linearly lift said support means as the level of the molten material falls to maintain the level of the molten material within the optimum heating zone of said heating means in said furnace chamber, said second lifting means exerting a resultant lifting force only along the longitudinal axis of said pull shaft means;

first rotating means to rotate said pull shaft means;

second rotating means to rotate said support means;

a seal between a portion of said first shaft of said pull shaft means at the entry of said pull shaft means into said furnace chamber and said furnace chamber to seal said pull shaft means at its entry into said furnace chamber during rotation of said pull shaft means;

and means to prevent relative linear motion between said seal and said pull shaft means when said first lifting means lifts said pull shaft means.

3,953,282

PROCESS FOR MANUFACTURING PAPER-LIKE SYNTHETIC SHEET

Yoshijiro Tabara; Hiroshi Akiyama; Masayuki Igawa; Tadashi Maekawa, and Tokuo Shinomiya, all of Otake, Japan, assignors to Mitsubishi Rayon Company Limited, Japan

Division of Ser. No. 864,457, Oct. 7, 1969, Pat. No. 3,904,804.
This application May 6, 1974, Ser. No. 467,591
Claims priority, application Japan, Oct. 14, 1968, 43-74209; Oct. 14, 1968, 43-74210; July 31, 1969, 44-60502; Aug. 2, 1969, 44-61322; Aug. 4, 1969, 44-61518
Int. Cl.² D21H *5/20, 5/26*
U.S. Cl. 162—102 11 Claims

1. A process for manufacturing a paper-like synthetic sheet, comprising

a. separating at a temperature of not higher than 60° C, a polyolefin micro-flake aggregate compound of numerous polyolefine microflakes interconnected with each other in random directions and consisting essentially of at least one polyolefin and 0.01 to 15%, based on the weight of said polyolefin, of at least one surface active compound mixed into said polyolefin, each microflake having a substantially flat, irregular shape and an average thickness of 5 to 20 μ, a maximum length of 20 mm and a specific surface area of at least 0.1 m^2/g, into discrete swollen microflakes in an organic liquid capable of swelling or partially dissolving said polyolefin at a temperature of 60° C or lower,

b. at the same time, homogeneously suspending said discrete microflakes into said organic liquid,

c. forming said suspended micro-flakes into paper-like sheet form, and

d. evaporating said organic liquid from said paper-like sheet formed in said (c) step.

3,953,283

PAPERBOARD HAVING IMPROVED OIL RESISTANCE

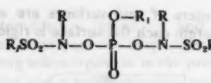
James H. Wing; James N. Stone, both of Augusta, and Franklin B. Thomas, III, Martinez, all of Ga., assignors to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 5, 1972, Ser. No. 295,382
Int. Cl.² D21H *3/02, 3/28*
U.S. Cl. 162—158 2 Claims

1. A process for preparing paperboard from cellulosic pulp having improved oil resistance which comprises

adjusting the pH of a suspension of cellulosic pulp between 5.8 and 7.3,

adding to the suspension an additive mixture of (1) 0.10 to 6.0 percent by weight of a cationically active material selected from the group consisting of cationically active starches and gums and hydrogen bonding starches and gums (2) 0.10 to 10.0 percent by weight of a water soluble salt of a saturated fatty acid having 12 to 20 carbon atoms and (3) about 0.07 to 0.50 percent by weight of a water soluble bis-perfluorosulfonamino alkyl phosphate based on the solids content of the suspension, the bis-perfluorosulfonamino alkyl phosphate having the general formula



wherein R_f is a perfluoroalkyl group having 4 to 12 carbon atoms, R is selected from the group consisting of hydrogen and an alkyl group having 1 to 6 carbon atoms and R_1 is an alkyl group having 1 to 6 carbon atoms,

precipitating the water soluble fatty acid salt throughout the pulp surface,

forming the pulp containing the additive mixture into a fibrous web and then drying the fibrous web to form the oil resistant paperboard.

3,953,284

DEWATERING BLADE LOCKING ASSEMBLY

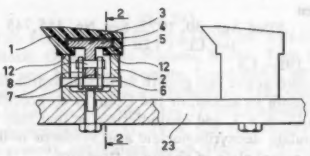
Osmo Rainer Eväläahti, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Finland

Filed Aug. 8, 1974, Ser. No. 495,772

Claims priority, application Finland, Aug. 15, 1973, 2563/73

Int. Cl.² D21F 1/48

U.S. Cl. 162—352 **4 Claims**



1. A dewatering device for paper machines comprising a rigid frame and an endless wire on said frame, said device including a dewatering blade in contact with the wire in a substantially transversal direction thereto, a supporting member attached to the frame below the wire, said dewatering blade in longitudinal slidable attachment on top of said supporting member, said supporting member having means for supporting the dewatering blade, locking means, and means for vertically adjusting the supporting and locking means in relation to each other for pressing the lower portion of the blade between the supporting member and locking means, the locking means being a rail with a substantially T-shaped cross section, the lower side of the dewatering blade having two flanges pointing towards each other in the longitudinal direction of the blade and fitted to extend under the arms of the rail of T-shaped cross section so that the flanges rest on the supporting means, the supporting means being a U-shaped rail inside which the locking member has been fitted, and the means for vertically adjusting the supporting member and locking means in relation to each other are lever arms, the upper ends thereof being connected to said locking means, the lower ends thereof being connected to said U-shaped rail.

3,953,285

NICKEL-CHROMIUM-SILICON BRAZING FILLER METAL

Angelo J. Martini, and Bruce R. Gourley, both of Pittsburgh, Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 25, 1973, Ser. No. 354,267

Int. Cl.² G21C 3/02

U.S. Cl. 176—66 **2 Claims**

1. A corrosion resistant joint between AM-350 stainless steel fuel rod grid components which exhibits no chromium depleted phase comprising a brazement formed by brazing said components with a nickel-base brazing filler metal having a melting temperature within the range of 2075°F. to 2150°F. consisting essentially of, in weight percent, 23% to 35% chromium, 9% to 12% silicon, a maximum of 0.15% carbon, a maximum of 1.00% other elements and the balance nickel.

3,953,286

CERAMIC NUCLEAR FUEL PELLETS

Ronald Henry Watson; Gregg Glenn Butler, both of Kirkham; Thomas John Heal, Lytham, St. Annes, and James Edgar Littlechild, Lytham, all of England, assignors to British Nuclear Fuels Limited, Warrington, England

Filed Jan. 11, 1974, Ser. No. 432,535

Claims priority, application United Kingdom, Jan. 12, 1973, 1665/73; May 18, 1973, 23795/73; May 18, 1973, 23796/73

Int. Cl.² G21C 3/62

U.S. Cl. 176—66 **8 Claims**

1. A sintered nuclear fuel pellet composed of metal oxide selected from the group consisting of uranium dioxide, plutonium dioxide and uranium dioxide and plutonium dioxide together, the pellet having voidage in the form of randomly distributed closed pores produced by inclusion of a fugitive pore former in the pellet prior to sintering, the mean pore size being substantially above that normally observed after sintering in the absence of a pore former the mean pore size being substantially above that normally observed after sintering, all the pores being near to their equilibrium state at the designated fuel density and each point in the fuel pellet being at most only a few grain diameters from a pore.

3,953,287

ASSEMBLY MECHANISM FOR NUCLEAR FUEL BUNDLES

John W. Long, and Barney S. Flora, both of Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Aug. 6, 1973, Ser. No. 386,201

Int. Cl.² G21C 3/32

U.S. Cl. 176—78 **9 Claims**

1. In a nuclear power reactor fuel bundle having a plurality of tie rods for securing a pair of spring-biased fuel rod mount-

ing end plates in assembled position, one end of said tie rods being fixed to one of said end plates and the other end of said rods being mounted for easy disassembly from the second of said end plates, a tie rod locking assembly which comprises:

a. a first opening extending through the second of said end plates and having at least one radially outward disposed guide slot extending for the length thereof through said second end plate;

b. tie rod guide means fixed in position at said other end of each of said tie rods for operable engagement with said guide slot and adapted to pass through said first opening;

c. a second opening recessed into the outer face of said second end plate opposite said fuel rods, said second recessed opening being radially disposed of said first opening and angularly displaced from said guide slot;

d. locking sleeve means mounted on said other end of each of said tie rods outwardly of said tie rod guide means and moveable about the axis of said tie rod, said locking sleeve provided with projection means adapted to be received within said second recessed opening for preventing the outward movement of said second end plate as urged by said springs.

3,953,288

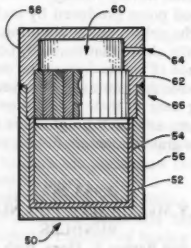
GAS VENTING

Edwin F. Johnson, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Mar. 24, 1970, Ser. No. 24,895

Int. Cl.² G21H 5/00; G21C 3/10

U.S. Cl. 176—79 **4 Claims**



1. Means for use in venting gas from a container having radioactive-material therein comprising a plurality of nonporous lamina of gas impervious material with juxtaposed and coentensive surfaces in intimate and unsintered direct diffusion interbonded contact with each other up to substantially 50% of said surfaces having intermediate the lamina a zone with a network of randomly oriented minute gas passages therethrough, said diffusion bonded lamina disposed in edgewise disposition intermediate the interior and exterior of said container for release of gas from the interior.

3,953,289

DEVICE FOR SUPPORTING A NUCLEAR REACTOR CORE

Didier Costes, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France

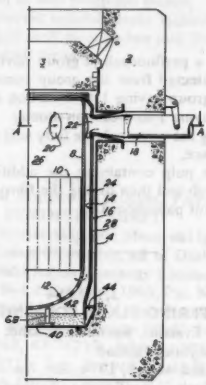
Filed Jan. 18, 1974, Ser. No. 434,696

Claims priority, application France, Jan. 23, 1973, 73.02249

Int. Cl.² G21C 15/12

U.S. Cl. 176—87 **8 Claims**

1. A device for supporting a reactor core structure of a nuclear reactor, wherein said device is constituted by a cylindrical shell having a plurality of flat surfaces in which the normals to the centers of said surfaces are approximately concurrent and wherein each flat surface is rigidly connected



at the center thereof to a reactor vessel and at the periphery thereof to the reactor core structure.

3,953,290

POLYPEPTIDES AS VITRO ACTIVE CELL GROWTH ENHANCING FACTORS AND METHODS OF USE

Knut Öivind Uthne, Sodertalje, and Gustaf Bertil Åberg, Bromma, both of Sweden, assignors to AB Kabi, Stockholm, Sweden

Filed Apr. 30, 1973, Ser. No. 355,745

Int. Cl.² C12B 3/12, 3/14

U.S. Cl. 195—1.8 **12 Claims**

1. In vitro active cell growth factors derivable from animal blood plasma or serum, or the Cohn et al. precipitate IV or solution IV—6 + 7, and characterized in that they

i. stimulate deoxyribonucleic acid synthesis in the cells,

ii. are polypeptide in chemical structure,

iii. have a molecular weight range of from 4,000 to 6,000 and

iv. an isoelectric range of from pH 4.3 to 5.3,

v. are soluble in and otherwise inert to about 72% aqueous ethanol containing by volume about 0.047% of concentrated hydrochloric acid,

vi. remain soluble in that aqueous ethanol after it is adjusted with 4M sodium hydroxide to pH 8.4,

vii. are precipitated from the resulting pH 8.4 aqueous ethanol solution by admixing that ethanol solution of pH 8.4 with 3.5 times its volume of a mixture of 5 parts of acetone with 3 parts of ethanol, and

viii. are soluble in about twice their weight of 20% formic acid.

3,953,291

PROCESS FOR PREPARING 6-AMINOPENICILLANIC ACID

Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto, and Tadashi Sato, Takatsuki, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Mar. 13, 1974, Ser. No. 450,655

Claims priority, application Japan, Mar. 24, 1973, 48-33769

Int. Cl.² C12D 9/00

U.S. Cl. 196—36 P **14 Claims**

1. A process for preparing 6-aminopenicillanic acid which comprises the steps of polymerizing at least one acryloly monomer selected from the group consisting of acryloylamide, N,N'-lower alkylene-bis-acryloylamide, bis

acryloylamidomethyl ether, and N,N'-diacryloylethyleneurea, in an aqueous suspension of a penicillin amidase-producing microorganism in the presence of a polymerization initiator and a polymerization accelerator to produce an immobilized penicillin amidase-producing microorganism, and subjecting the immobilized penicillin amidase-producing microorganism to enzymatic reaction with penicillin.

3,953,292

ENZYMES BOUND TO HEAT-ACTIVATED ATTAPULGITE CLAY

Robert A. Burns, Long Valley, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Menlo Park, Edison, N.J.

Continuation-in-part of Ser. No. 438,563, Feb. 1, 1974, abandoned. This application Jan. 27, 1975, Ser. No. 544,359

Int. Cl.² C07G *7/02*

U.S. Cl. 195—63 **12 Claims**

1. An insolubilized enzymatically active composite in the form of mechanically stable particles comprising sized granules essentially all of which are larger than 50 microns and smaller than 1000 microns of heat-activated attapulgite clay having a volatile matter content below 18% by weight, a surface area in the range of about 100 to 150 m^2/g. as determined by the nitrogen absorption method of Brunauer, Emmett and Teller and a porosity in the range of about 0.5 to 0.6 ml./g. wherein the pore distribution is such that the major contribution to the total pore volume is derived from pores with radii larger than 500 Angstrom units, an organosilane coated on the surface of said granules, a crosslinking agent covalently bound to said organosilane and an enzyme covalently bound to said crosslinking agent.

3,953,293

PROCESS FOR THE PREPARATION OF XYLOSTASIN

Satoshi Horii, Osaka; Ikuo Nogami, Kyoto; Toru Hasegawa, Kawani, and Masahiko Yoneda, Uozakinaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 362,504, May 21, 1973, abandoned. This application July 31, 1974, Ser. No. 493,6[illegible]9

Claims priority, application Japan, May 31, 1972, 47-54581

Int. Cl.² C12D *9/20*

U.S. Cl. 195—96 **5 Claims**

1. A process for producing O-β-D-xylofuranosyl-(1⟶5)-O-[α-2,6-diamino-2,6-dideoxy-D-glucopyranosyl-(1⟶4)]2-deoxystreptamine of a pharmaceutically acceptable acid salt thereof, which comprises cultivating a microorganism belonging to the genus Bacillus, which is capable of producing the antibiotic, in a culture medium containing assimilable carbon sources, digestible nitrogen sources and other nutrient sources necessary for the growth of the microorganism until the antibiotic is accumulated in the culture broth, and recovering the antibiotic from the culture broth.

3,953,294

TRANSAMINASE ASSAY

Alexander A. Monte, and Ching Chiang, both of Glendora, Calif., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 200,552, Nov. 19, 1971, Pat. No. 3,816,262, which is a continuation-in-part of Ser. No. 190,883, Oct. 20, 1971, abandoned. This application May 6, 1974, Ser. No. 467,320

Int. Cl.² G01N *31/14*; C07G *7/02*

U.S. Cl. 195—103.5 R **24 Claims**

1. A reagent formulation for use in assaying a biological specimen for glutamic oxaloacetic transaminase comprising a granular, water-soluble, substantially anhydrous, storage-stable mixture containing L-aspartic acid, malate dehydrogenase, reduced nicotinamide adenine dinucleotide disodium salt, bovine serum albumin, a carbohydrate polymer, tris-(hydroxymethyl)-aminomethane, succinic acid, gum arabic, and a nitrogen-containing polyoxyalkylene nonionic surfactant obtained by the sequential reaction of ethylenediamine with propylene oxide and ethylene oxide in the presence of a catalyst, said surfactant containing polyoxypropylene chains having an average molecular weight of between about 750 and about 6,750 and polyoxyethylene chains constituting between about 10 and about 80 weight percent of said surfactant.

3,953,295

REAGENT FORMULATIONS FOR GLUCOSE ASSAY

Alexander A. Monte, and Ching Chiang, both of Glendora, Calif., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 200,552, Nov. 19, 1971, Pat. No. 3,816,262, which is a continuation-in-part of Ser. No. 190,883, Oct. 20, 1971, abandoned. This application May 6, 1974, Ser. No. 467,423

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **14 Claims**

1. An enzyme reagent formulation for use in assaying a biological specimen for glucose comprising a granular, water-soluble, substantially anhydrous, storage-stable mixture containing glucose oxidase, peroxidase, gum arabic, mannitol, bovine serum albumin and a nitrogen-containing polyoxyalkylene nonionic surfactant obtained by the sequential reaction of ethylenediamine with propylene oxide and ethylene oxide in the presence of a catalyst, said surfactant containing polyoxypropylene chains having an average molecular weight of between about 750 and about 6,750 and polyoxyethylene chains constituting between about 10 and about 80 weight percent of said surfactant.

3,953,296

ENZYME RECOVERY BY ULTRAFILTRATION IN ENZYMATIC ANALYSIS

Helmut Trutnovsky, Graz-Andritz, and Benno Paletta, Graz, both of Austria, assignors to The Kreidl Chemico Physical Kommanditgesellschaft, Schann

Filed July 24, 1974, Ser. No. 491,484

Claims priority, application Austria, July 26, 1973, 6600/73; Feb. 11, 1974, 1074/74

Int. Cl.² C12K *1/04*, *1/10*

U.S. Cl. 195—103.5 R **7 Claims**

1. In a method for determining the concentration of low-molecular biological substances by reaction with an enzyme including the steps of contacting a low molecular biological sample with an enzyme, thereby producing low molecular reaction products, quantitatively measuring the concentration of the low molecular reactions products and discarding the unreacted sample and the low molecular reaction products after measuring, the improvement of recovering a substantial portion of the enzyme comprising separating the low-molecular reaction products and unreacted sample from the enzyme by a first ultra-filtration into a filtrate containing substantially all of the low molecular reaction products and unreacted sample and a concentrate containing the enzyme and a trace quantity of the low molecular reaction products and unreacted sample, diluting the concentrate and subjecting the concentrate to at least one additional ultra-filtration, recovering the enzyme therefrom substantially devoid of low molecular reaction products and unreacted sample, and reusing the thus separated enzyme in the continuous concentration determination.

3,953,297

DETERMINATION OF AMYLASE

E. Melvin Gindler, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Division of Ser. No. 335,736, Feb. 26, 1973, Pat. No. 3,869,348. This application Nov. 15, 1974, Ser. No. 524,246

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **10 Claims**

1. In a colorimetric process for the determination of amylase activity comprising adding a reagent solution containing

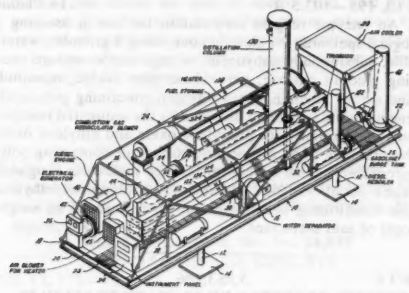
an aromatic nitro compound reducible by lower sugars to an amylase hydrolyzed starch substrate and measuring the change in color or intensity; the improvement wherein the reagent solution comprises, in addition to the nitro compound, an iminodiacetic acid derivative chelating compound having substantially no reducing properties and at least about 0.03 mol./100 ml. of a higher alkali metal cation.

3,953,298

MOBILE REFINERY

Jim Smith Hogan, Houston, Tex., assignor to Val Verde Corporation, Houston, Tex.

Filed May 6, 1974, Ser. No. 467,081
Int. Cl.² B01D *1/00*
U.S. Cl. 196—133 **9 Claims**



1. A portable crude oil distillation unit suitable for transporting on highways as a single unit comprising

a crude oil heater,

a fractionating tower connected to receive heated crude oil from said heater and to separate the crude oil into liquid and gaseous fractions,

a power unit connected to provide power for said distillation unit,

heat exchanger units connected to receive products from said fractionating tower, and

an air cooler connected to receive said products for further cooling,

all of which, together with supporting equipment, is mounted on a single skid, said skid comprising

a plurality of elongate and cross beams forming a base frame and supporting bed,

reinforcing structure connected to each of said elongate beams and extending upwardly therefrom intermediate elements of the distillation unit, thereby forming with said beams a plurality of unitary parallel trusses, and

structural members intermediate elements of the distillation unit extending between and connecting the trusses and the beams together, said elongate beams having insufficient strength to bear the weight of the aforesaid heater, tower, power unit, heat exchanger units, air cooler and supporting equipment, and said trusses including said beams having sufficient strength to bear such weight.

3,953,299

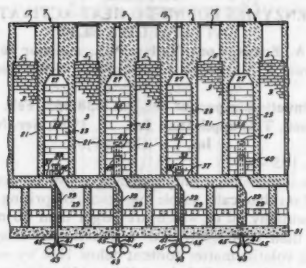
COKE OVEN HAVING A LOW BURNER HEATING WALL AND A HIGH BURNER HEATING WALL

John J. Strepelis, Bethlehem, Pa., and Wayne C. Gensler, Hillside, N.J., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Aug. 14, 1974, Ser. No. 497,440
Int. Cl.² C10B *5/02, 21/12, 21/18*
U.S. Cl. 202—139 **5 Claims**

1. In combination, a coke oven battery having a plurality of horizontal coking chambers and between each said coking chamber a heating wall containing a plurality of vertical heating flues; said heating walls and heating flues comprising

a. a low burner heating wall having plural hairpin flues therein on one side of each of said coking chambers each said flue having a burner means, said burner means consisting of a low burner in which the height of said low burner relative to the height of the flue is in the ratio of about 1:22 to 1:8; and



b. a high burner heating wall having plural hairpin flues therein on the other side of each of said coking chambers each said flue having a burner means, said burner means consisting of a high burner in which the height of said high burner relative to the height of the flue is in the ratio of about 1:5 to 1:3; and

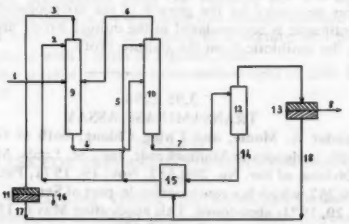
c. means for operably connecting said low and high burners for heating to a fuel and air source; whereby improved vertical temperature distribution in the material within each said coking chamber is obtained.

3,953,300

PROCESS FOR SEPARATING A HIGH PURITY VINYL AROMATIC HYDROCARBON FROM HYDROCARBON MIXTURES CONTAINING THE SAME

Alessandro Ginnasi, San Donato Milanese; Alessandro Vetere, Milan, and Pierantonio Martera, San Donato Milanese, all of Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 417,377, Nov. 19, 1973, abandoned.
This application July 11, 1975, Ser. No. 595,291
Claims priority, application Italy, Nov. 29, 1972, 32208/72
Int. Cl.² B01D *3/40;* **C07C** *15/10*
U.S. Cl. 203—53 **1 Claim**



1. Process for separating styrene from a hydrocarbon mixture containing styrene, xylenes including o-xylene, saturated and olefinic hydrocarbons and ethyl benzene by means of extractive distillation with N-formyl morpholine as extraction solvent in admixture with an amount of water in the range of from 5% to 20% by weight, comprising the following steps:

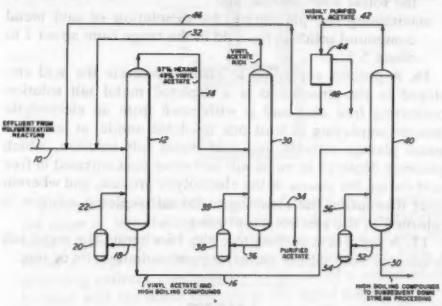
1. feeding said hydrocarbon mixture to the intermediate zone, and feeding said solvent-water mixture in proximity to the top, of a first extractive distillation column;

2. withdrawing from the top of said first extractive distillation column a hydrocarbon stream constituted essentially of most of said xylenes, saturated and olefinic hydrocarbons, ethyl benzene and water;
3. discharging from the bottom of said first extractive distillation column a stream constituted essentially of styrene, o-xylene and extraction solvent;
4. feeding the stream from step (3) to a second extractive distillation column and feeding the solvent-water to said second extractive distillation column in proximity to its top;
5. withdrawing from the top of said second extractive distillation column a stream constituted of water, styrene and o-xylene and recycling the same to the first extractive distillation column in proximity to the primary feed;
6. discharging from the bottom of the second extractive distillation column a stream constituted essentially of styrene, solvent and water; and
7. feeding the stream from step (6) to a stripper and withdrawing styrene and water as overhead product, and, as bottom product, solvent for recycle to said extractive distillation columns; and
8. separating the water from the styrene in the overhead product of step (7) by decantation and recovering said styrene.

3,953,301
RECOVERY OF HEXANE FROM RECYCLE STREAMS FROM ETHYLENE POLYMERIZATION REACTORS

Tomas Mendez, Orange, and Guy Van Cleve, Jr., Port Arthur, both of Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Sept. 5, 1974, Ser. No. 503,525
Int. Cl.² B01D *3/00, 3/10*
U.S. Cl. 203—75 **4 Claims**



1. A method for continuously recovering hexane from the mixed recycle stream from a plurality of ethylene polymerization reactors, said recycle stream always containing hexane and periodically containing at least one chemical from the group consisting of vinyl acetate, alkyl acrylate esters, and other organic chemicals, which have an atmospheric boiling point higher than 72°C. and which do not form a ternary azeotrope with hexane and vinyl acetate and which do not form a binary azeotrope with vinyl acetate, which method consists essentially of:
1. Feeding to a first distillation column, a distillable mixture containing hexane and at least 45 wt% vinyl acetate, said distillable mixture being formed by combining,
   a. A recycle stream from a plurality of ethylene polymerization reactors, which recycle stream contains hexane,
   b. The total overhead fraction from step 7, and
   c. At least a portion of the overhead fraction of step 12; said portion being used to maintain said at least 45 wt% vinyl acetate in the distillable mixture
2. operating said first distillation column at atmospheric pressure;
3. recovering from said first distillation column an overhead fraction containing substantially 57% by weight of hexane and 43% by weight of vinyl acetate;
4. recovering from said first distillation column a bottoms fraction free of hexane and containing only vinyl acetate and compounds other than hexane and vinyl acetate included in the recycle stream fed to step (1);
5. feeding the overhead fraction from step (3) to a second distillation column;
6. operating said second distillation column at a pressure of at least 4 atmospheres;
7. recovering from said second distillation column an overhead fraction containing in excess of 43% by weight of vinyl acetate and the balance hexane;
8. recovering from said second distillation column a bottoms fraction consisting entirely of hexane;
9. recycling the entire overhead fraction from step (7) to step (1);
10. feeding the bottoms fraction from step (4) to a third distillation column;
11. operating said third distillation column at substantially atmospheric pressure;
12. recovering from said third distillation column an overhead fraction consisting solely of vinyl acetate;
13. recovering from said third distillation column a bottoms fraction consisting solely of the chemicals other than hexane and vinyl acetate included in the recycle stream fed to step (1); and
14. recycling at least a portion of the overhead fraction from step (12) to step (1) to maintain the concentration of vinyl acetate in step (1) at a level of at least 45% by weight of the material fed to the first distillation column.

3,953,302
PREVENTION OF DENDRITIC PLATING OF LITHIUM

Bhaskara M. L. Rao, Billerica, and Carl R. Schlaikjer, Arlington, both of Mass., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Aug. 16, 1973, Ser. No. 388,870
Int. Cl.² C25D *3/56, 3/42*
U.S. Cl. 204—14 N **8 Claims**

1. A method for non-dendritic plating of lithium at lithium deposition voltages by utilizing non-aqueous electrolytes containing lithium salts aprotic organic solvents and addition agents having metallic elements capable of coplating with lithium to form lithium rich intermetallics or alloys wherein the concentration of said additive agents does not exceed the amount which will render the lithium more noble by one and a half volts from the normal lithium EMF activity.

3,953,303
PROCESS FOR THE MANUFACTURE OF MESH SCREEN FOR X-RAY PHOTOGRAPHY SENSITIZATION

Hatohiko Kamada, and Koichi Tashiro, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 188,494, Aug. 12, 1971, abandoned. This application Feb. 6, 1974, Ser. No. 440,091
Claims priority, application Japan, Oct. 12, 1970, 45-89559
Int. Cl.² C25D *5/02;* **G03F** *5/00*
U.S. Cl. 204—15 **5 Claims**

1. In a process of making a medical X-ray photograph by applying fluorescent sensitization screens having more than 80 lines per inch of a heavy metal having an atomic weight of more than 63 and a width of 10 microns or less, said screen having a thickness of 20 to 50 microns, to both surfaces of photographic sensitive material coated with an emulsion on both surfaces of the support therefore and directing X-rays thereto through an object, the improvement in which said screen is produced by the process comprising
   a. forming a layer of a heavy metal on the surface of a support,

b. applying a layer of a light sensitive polymer consisting mainly of vinyl cinnamate over said layer of a heavy metal,

c. exposing said layer of a light sensitive polymer through a positive original having a mesh or strip screen of more than 80 lines per inch thereon,

d. removing the unexposed portions of said layer of a light sensitive polymer whereby the portions of said layer of a heavy metal corresponding to the unexposed portions of said layer of a light sensitive polymer is exposed,

e. electroplating a layer of a heavy metal over said portions of said heavy metal layer, and then fluorescent sensitizing said screen without removing said exposed layer of light sensitive polymer.

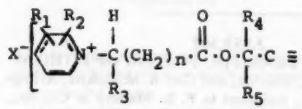
3,953,304

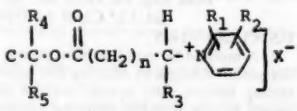
ELECTROPLATING BATHS FOR NICKEL AND BRIGHTENER-LEVELER COMPOSITIONS THEREFOR

John L. Allan, Glen Rock; Kollengode V. Srinivasan, Saddle Brook; Philip D. Readio, Sparta, all of N.J., and Judit Cestero, New York, N.Y., assignors to Dart Industries Inc., Los Angeles, Calif.

Filed June 23, 1975, Ser. No. 589,114
Int. Cl.² C25D 3/16; C07D 213/55
U.S. Cl. 204—49 19 Claims

1. A plating bath for the electroplating of nickel comprising an aqueous acidic solution of at least one nickel salt and from about 0.01 to about 1.0 grams per liter of a quaternary compound having the general formula





wherein R_1 and R_2 are hydrogen, halogen or a hydroxy, carboxy, carboxyester, sulphoxy, alkyl, amino or amido group;

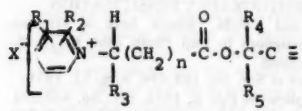
R_3 is hydrogen or an alkyl group;

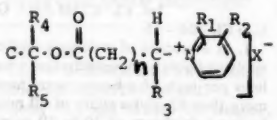
R_4 and R_5 are hydrogen or an alkyl group;

X is a halogen and

n is an integer from 0 to 2.

14. A quaternary compound having the general formula





wherein R_1 and R_2 are hydrogen, halogen or a hydroxy, carboxy, carboxyester, sulphoxy, alkyl, amino or amido group;

R_3 is hydrogen or an alkyl group;

R_4 and R_5 are hydrogen or an alkyl group;

X is a halogen and

n is an integer from 0 to 2.

3,953,305

CATALYST REGENERATION

John F. Connolly, Wheaton, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Jan. 17, 1975, Ser. No. 541,801
Int. Cl.² C25B 1/00, 3/02
U.S. Cl. 204—97 11 Claims

1. The process of producing glycols which comprises (1) oxidizing an olefinic compound to a glycol in an aqueous acidic medium comprising a source of catalytically active osmium tetroxide, (2) chemically regenerating osmium tetroxide by oxidizing hexavalent osmium with hexavalent chromium and (3) electrochemically regenerating hexavalent chromium from lower valent chromium.

3,953,306

METAL RECOVERY FROM WASTE TREATMENT SLUDGES

Leslie E. Lancy, Ellwood City, Pa., assignor to Dart Environment and Services Company, Los Angeles, Calif.

Filed Oct. 3, 1973, Ser. No. 403,147
Int. Cl.² C01F 7/74; C25C 1/12, 1/14, 1/06
U.S. Cl. 204—106 17 Claims

1. In a process for the recovery of metal values from waste metal streams wherein a precipitant is added to said waste metal stream to form a dilute aqueous slurry of metal compound solids selected from metal hydroxide or metal carbonate, the slurry is concentrated by removing a portion of the aqueous phase and the metal compound solids are dissolved in an acid, the improvement which comprises:

washing the concentrated slurry in at least one step to remove soluble compounds;

maintaining a sufficient amount of water at all times during each of the concentration and washing steps to provide a supernatant aqueous phase above the upper surface of the solids when settled; and

maintaining the pH during the dissolution of said metal compound solids in the acid in the range from about 1 to about 5.5.

16. A process according to claim 1 wherein the acid employed in the dissolution is a depleted metal salt solution containing free acid and is withdrawn from an electrolytic process employing at least one insoluble anode, at least one metal plating cathode and said metal salt solution, which becomes depleted in metal salt and more concentrated in free acid during the course of the electrolytic process, and wherein after dissolution the resulting metal salt repleted solution is returned to the electrolytic process.

17. A process according to claim 16 wherein the metal salt is selected from salts of nickel, copper, cadmium, tin or zinc.

3,953,307

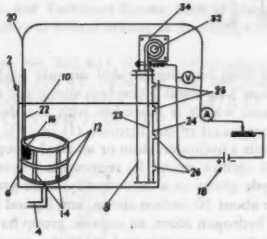
VAT DYE REDUCTION PROCESS FOR USE IN A DYEING PLANT FOR TEXTILE PROCESSING

Shashikant Dattatraya Supanekar, and Erach Hormasji Daruwalla, both of Bombay, India, assignors to Bombay Textile Research Association, India

Filed July 31, 1974, Ser. No. 493,432
Claims priority, application France, Apr. 4, 1974, 74.11634
Int. Cl.² B01K 1/00; C23B 1/22
U.S. Cl. 204—134 6 Claims

1. A process for compensating for reduction in the reducing effect caused by atmospheric oxygen or dissolved oxygen in an aqueous reducing solution of sodium hydrosulphite employed in the vat dye reduction process wherein vat dye is reduced and fixed on textile materials by the reducing action of the aqueous alkaline reducing solution, which process comprises continuously or intermittently forming sulphoxylic acid as a powerful reducing species with relatively high redox potential in said aqueous reducing solution to maintain the reducing strength of said solution, by continuously or intermittently carrying out electrolysis directly through said solution employing a relatively large negative electrode submerged in said

solution and a relatively small positive electrode submerged or on the surface of said solution, said negative and positive



electrodes being operatively connected to a direct current source.

3,953,308

PROCESS AND APPARATUS FOR DESULFURIZING OF LIQUID METALS

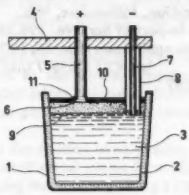
Christian Gatellier, Metz, and Michel Olette, Lessy, both of France, assignors to Institut de Recherches de la Siderurgie Francaise (IRSID), Saint-Germain-En-Laye, France

Filed Mar. 18, 1975, Ser. No. 559,597

Claims priority, application France, Mar. 27, 1974, 74.10589

Int. Cl.² C25F *1/00*

U.S. Cl. 204—140 **20 Claims**



1. A process of desulfurization of liquid metal comprising the steps of introducing the liquid metal into a metallurgical vessel; spreading over part of the free surface of the liquid metal a layer of solid electrolyte in pulverulent form and providing cationic conductivity by means of a cation adapted to react with the sulfur content in the liquid metal; contacting the electrolyte layer with a first electrically conductive electrode; contacting the liquid metal with a second electrically conductive electrode; and connecting said electrodes to an electric circuit to pass a direct current through the electrolyte, the electrode contacting the metal being connected as cathode in the circuit.

3,953,309

POLYMERIZATION COMPOSITIONS AND PROCESSES HAVING POLYMERIC BINDING AGENTS

Michael N. Gilano, Fullerton, Calif.; Richard E. Beaupre, West Barrington, R.I., and Melvin A. Lipson, Fullerton, Calif., assignors to Dynachem Corporation, Santa Fe Springs, Calif.

Division of Ser. No. 315,153, Dec. 14, 1972, Pat. No. 3,887,450, which is a continuation of Ser. No. 112,797, Feb. 4, 1971, abandoned. This application Dec. 3, 1974, Ser. No. 529,062

Int. Cl.² C08F *8/00*; G03C *1/68*

U.S. Cl. 204—159.16 **38 Claims**

1. A process for making a photoresist which comprises: preparing a photopolymerizable layer comprising:

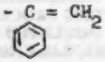
A. from 10 to 60 parts by weight of an addition polymerizable material consisting essentially of and being solely one or more non-gaseous compounds, containing at least two terminal ethylenic groups, having a boiling point above 100° C. and being selected from the group consisting of an unsaturated ester of a polyol, an unsaturated amide, and a vinyl ester;

B. from 0.001 to 10 parts by weight of a photoinitiated free-radical generating addition polymerizing initiating system;

C. from 0.001 to 5 parts by weight of a thermaladdition polymerization inhibitor; and

D. from 40 to 90 parts by weight of a preformed macromolecular polymeric binding agent which is a polymer of:

a first monomeric material which contains one or more non-acidic vinyl compounds selected from the group having the general formula:



wherein R is hydrogen, an alkyl group having from 1 to 6 carbon atoms or a halo group; and

a second monomeric material which consists essentially of one or more alpha,beta-unsaturated carboxyl-containing monomers having from 3 to 15 carbon atoms;

wherein the ratio of the first monomeric material to the second monomeric material is sufficient to render the binding agent soluble in a dilute aqueous solution containing from 0.01 to 10% of a water-soluble base; exposing a portion of said photopolymerizable layer to actinic light; and washing said layer with a dilute aqueous alkaline solution to dissolve the unexposed portion of the photopolymerizable layer.

7. A process for making a photoresist which comprises: preparing a photopolymerizable layer comprising:

A. from 10 to 60 parts by weight of an addition polymerizable material consisting essentially of and being solely one or more non-gaseous compounds, containing at least two terminal ethylenic groups, having a boiling point above 100° C. and being selected from the group consisting of an unsaturated ester of a polyol, an unsaturated amide, and a vinyl ester;

B. from 0.001 to 10 parts by weight of a photoinitiated free-radical generating addition polymerizing initiating system;

C. from 0.001 to 5 parts by weight of a thermaladdition polymerization inhibitor; and

D. from 40 to 90 parts by weight of a preformed macromolecular polymeric binding agent which is a polymer of:

a first monomeric material which contains one or more non-acidic vinyl compounds selected from the group having the general formula:

wherein, when X is hydrogen, Y is $OOCR_1$, OR_1, OCR_1, $COOR_1$, CN, $CH{=}CH_2$,

or Cl; when X is methyl, Y is $COOR_1$, CN, $CH{=}CH_2$, or

and when X is chlorine, Y is Cl; and wherein R_1 is an alkyl group having from 1 to 12 carbon atoms, a phenyl group or a

benzyl group and R_3 and R_4 are hydrogen, an alkyl group having from 1 to 12 carbon atoms or a benzyl group; and

a second monomeric material which consists essentially of one or more alpha,beta-unsaturated carboxyl-containing monomers having from 3 to 15 carbon atoms;

wherein the ratio of the first monomeric material to the second monomeric material is sufficient to render the binding agent soluble in a dilute aqueous solution containing from 0.01 to 10% of a water-soluble base; exposing a portion of said photopolymerizable layer to actinic light; and washing said layer with a dilute aqueous alkaline solution to dissolve the unexposed portion of the photopolymerizable layer.

3,953,310

ELECTROCOATING PROCESS FOR PRODUCING INSULATED WIRE

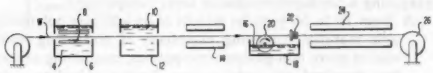
Yukio Hiraoka, Osaka; Sadao Nakao, and Yoshinobu Noda, both of Itami, all of Japan, assignors to Dainichi-Nippon Cables, Ltd., Amagasaki, Japan

Division of Ser. No. 394,611, Sept. 5, 1973, Pat. No. 3,906,139. This application Feb. 20, 1975, Ser. No. 551,447

Claims priority, application Japan, Sept. 5, 1972, 47-103340[U]

Int. Cl.² C25D *13/06, 13/16*

U.S. Cl. 204—181 **6 Claims**



1. A method for producing an insulating wire comprising a conductor having thereon an overcoating of a baked insulating layer of a polyacryl resin and a baked layer of a polyester resin overcoated on said polyacryl resin layer, comprising the steps of

a. electrophoretically depositing said polyacryl resin layer on said conductor;

b. subjecting said deposited polyacryl resin layer on said conductor in an organic solvent bath to a DC voltage of from about 30 to 500 volts applied between said conductor and a cathode in said organic solvent bath;

c. drying said polyacryl resin layer on said conductor;

d. dipcoating said polyester resin layer over said polyacryl resin layer on said conductor; and

e. baking said polyester resin layer and said polyacryl resin layer at a temperature of from about 200 to 500°C, said polyacryl resin comprising a copolymer of (a) at least one compound represented by the formula (I):

(I)

b. at least one compound represented by the formula (II)

(II)

and

c. at least one unsaturated organic acid, said acid having from 3 to about 30 carbon atoms and at least one double bond which is reactable with the double bond of said compound of the formula (I) or (II), wherein R_1 represents a hydrogen atom or an alkyl group having 1 to about 30 carbon atoms, R_2 represents a cyano group, an aldehyde group or a carboxyalkyl ester group having from 2 to about 30 carbon atoms, and R_3 and R_4 each represents a hydrogen atom, an organic group having 1 to about 30 carbon atoms selected from the group consisting of an alkyl group, an amide group, an N-alkylamide group, an alkylol group, a glycidyl-ether group and a glycidylester group, except that both R_3 and R_4 are not simultaneously a hydrogen atom or an alkyl group and said polyester resin comprising a copolymer of (d) at least one compound selected from the group consisting of terephthalic acid and a derivative thereof, and (e) a mixture of polyols comprising at least one diol and at least one of a triol, a tetraol, or a mixture of a triol and a tetraol, and said polyol mixture containing about 40 to about 97% equivalents of said diol.

3,953,311

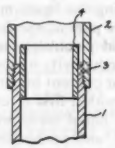
CATHODIC PROTECTION SYSTEM

Loerwood C. Wasson, Milwaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 298,286, Oct. 17, 1972, abandoned. This application Apr. 25, 1974, Ser. No. 463,897

Int. Cl.² C23F *13/00*

U.S. Cl. 204—197 **5 Claims**



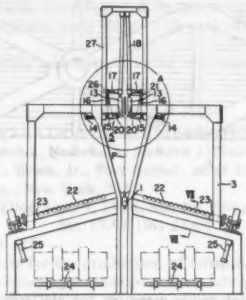
1. A cathodically protected internal joint of a water conducting system in a water heater, which comprises a first tubular conduit secured to the water heater, a second tubular conduit threaded onto the outboard end of the first tubular conduit to form a joint therebetween and provide for flow of water through the joint area, one conduit tending to be anodic with respect to the other conduit, and a ring of material more anodic than the said conduits secured internally of said first conduit in intimate contact therewith but having a portion of the outer cylindrical surface of the ring exposed so as to release electrons outwardly to provide cathodic protection at the joint area for said conduits exposed to the water flow therethrough.

3,953,312

APPARATUS FOR PEELING ELECTRODEPOSITED METAL OFF CATHODE BASE PLATE

Takahiro Kikkawa, and Toshinori Hirata, both of Onza-Higashi, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 302,843, Nov. 1, 1972, abandoned. This application July 10, 1974, Ser. No. 487,204
Claims priority, application Japan, Apr. 19, 1972, 47-38728
Int. Cl.² C25D 17/00, 1/00, 1/04
U.S. Cl. 204—198 3 Claims



1. An apparatus for peeling off electrodeposited metal plates from cathode base plates, comprising:

conveyor means for moving upright workpieces comprised of cathode base plates having electrodeposited metal plates adhering thereon through two work stations in series;

impact means located at the first work station for applying repeated impacts to the electrodeposited metal plates adjacent the upper edges thereof to form voids between the cathode base plate and the electrodeposited metal plates;

stripping means at the second work station for peeling off the electrodeposited metal plates from the cathode base plate, said stripping means comprising a stationary framework defining an upright passage through which the upright workpieces move, said framework having an overhead portion located above said passage, a pair of fluid pressure motors comprising a pair of cylinders supported on said overhead framework and pivotally mounted thereon so that their lower ends are laterally movable toward and away from said passage, said cylinders extending downwardly from said framework so that their lower ends are located close to the upper end of said passage on opposite sides thereof, pistons projecting from the lower ends of said cylinders and having wedges thereon positioned for engagement with the opposite surfaces of the cathode base plate and being movable downwardly along the cathode base plate in response to supply of fluid pressure to said cylinders in order to strip off the electrodeposited metal plates, said cylinders each having a guide rod projecting laterally therefrom in a direction away from said passage, a pair of clamp bodies respectively associated with said cylinders, each clamp body having an upwardly extending arm slidably mounted on said guide rod of its associated cylinder and a coil spring encircling said guide rod and bearing at one end against said arm and urging said arm and said clamp body outwardly on said guide rod, said clamp bodies being substantially U-shaped and having clamp plates on the free ends of the legs thereof disposed for engaging the upper portions of the cathode base plate above the upper edges of the electrodeposited metal plates for clamping said workpiece in a fixed upright position, said wedges respectively being disposed between said legs of said clamp bodies, each clamp body having mounted thereon at positions outside of and adjacent the clamp plates thereof a pair of nozzles arranged to direct low pressure fluid against the cathode base plate at an angle of from +45° to −45° relative to an imaginary line perpendicular to the vertical plane of the cathode base plate and against the upper edges of the electrodeposited metal plates to separate the upper edges of the electrodeposited metal plates from the cathode base plate;

motor means for moving said clamp bodies laterally of said passage into and out of clamping engagement with the upper portion of the cathode base plate and thereby moving said wedges likewise into resilient contact with said upper portion of the cathode base plate under the compression forces of said springs; and

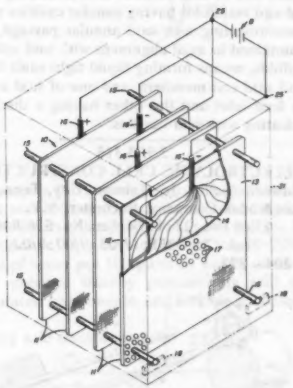
means for receiving the electrodeposited metal plates peeled off by said wedges.

3,953,313

ELECTROLYTIC CELL AND ELECTRODE THEREFOR

Gerald I. P. Levenson, Middlesex, England, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 370,500, June 15, 1973, abandoned. This application Mar. 6, 1975, Ser. No. 555,765
Claims priority, application United Kingdom, June 30, 1972, 30782/72
Int. Cl.² B01K 1/00; C25B 9/02
U.S. Cl. 204—267 10 Claims



1. An electrode for an electrolytic cell comprising:

a frame of rigid plastic material having a hollow interior;

a sheet of porous support material on each side of said frame enclosing said hollow interior, said sheet of porous support material being flexible and being secured to said frame;

a plurality of fibers of electrically conductive material within said hollow interior, captured by said porous support material;

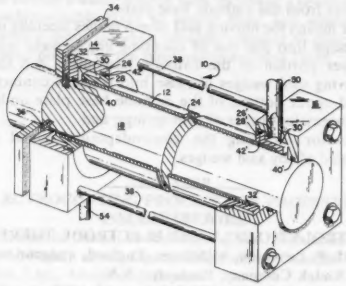
said electrode also comprising means connecting together said porous support material on opposite sides of said frame and acting to hold said fibers in place; and

an electrical connector extending from said hollow interior to the outside of said frame, said connector being formed from said fibers.

3,953,314
ELECTROLYTIC CELL CONSTRUCTION

Albert Edward Spaller, Jr., Johnson City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,045
Int. Cl.² C25C 7/00, 7/02
U.S. Cl. 204—272 5 Claims

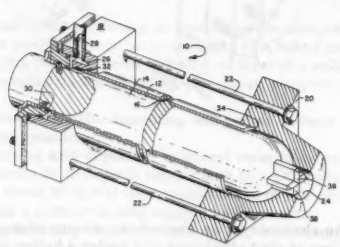


1. An electrolytic cell adapted for the oxidation of an aromatic compound during passage through said cell comprising a hollow, cylindrical cathode and a cylindrical anode smaller in diameter than the inside diameter of said cathode positioned therein so as to form an annular passage between said anode and cathode, said anode being at least co-extensive with said cathode, insulating end manifolds circumferentially engaging each end of said cathode and extending beyond said ends, said end manifolds having annular cavities circumferentially communicating with said annular passage, said anode being maintained in axial alignment with said cathode by the end manifolds, means forming liquid tight seals between said anode and said end members, and one of said end members having a feed inlet and the other having a discharge outlet communicating with said cavities.

3,953,315
ELECTROLYTIC CELL CONSTRUCTION

Albert Edward Spaller, Jr., Johnson City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 23, 1974, Ser. No. 536,046
Int. Cl.² C25B 11/02, 9/00, 9/02
U.S. Cl. 204—272 2 Claims

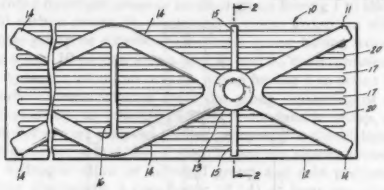


1. In an electrolytic call wherein an aromatic compound is oxidized as it is caused to flow through the cell, said cell havig a hollow, cylindrical cathode and a smaller cylindrical anode positioned inside of and substantially coaxial with said cathode defining an annular passage for flow of said aromatic compound between the electrodes, and a pair of openings in said cathode for feed and discharge of said aromatic compound, the improvement which comprises a member fabricated from electrical insulating material axially aligned with and firmly affixed to the end of said anode and extending into firm engagement with an opening in the end of said cell axially aligned with said cathode to maintain said electrodes in alignment during operation of said cell.

3,953,316
METAL ANODE ASSEMBLY

Joseph E. Baker, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.

Filed Nov. 5, 1973, Ser. No. 412,936
Int. Cl.² C25B 9/02, 11/02, 11/10
U.S. Cl. 204—288 6 Claims



1. In a metal anode assembly for electrolysis of flowing brine in an electrolytic mercury cell, wherein said metal anode assembly is comprised of

a. a distributor,

b. at least one anode support receiver positioned in the top of said distributor,

c. an anodic surface in electric contact with and positioned below said distributor,

d. said anodic surface is activated by applying a coating of an oxide of at least one platinum group metal, the improvement which comprises

1. employing as said distributor a spider-like distributor having a plurality of support ribs,

2. employing as said metal anode assembly an integral titanium casting comprised of

a. said distributor,

b. said anodic surface,

c. said anode support receiver,

3. said anodic surface having a first set of two opposite sides longer than the remaining set of two opposite sides,

4. said anodic surface being formed of a series of spaced-apart bars parallel to said first set of opposite sides and

5. said metal anode assembly being adapted for positioning in said cell with said spaced-apart bars parallel to the direction of flow of said brine.

3,953,317
COMPOSITION AND METHOD FOR SEPARATING BITUMINOUS CONSTITUENTS FROM BITUMINUM-BEARING SANDS

Elman B. Myers, deceased, late of Wayne, N.J., and by Marian M. Myers, administratrix, 550 Berdan Ave., Wayne, N.J. 07470

Filed Feb. 21, 1974, Ser. No. 444,566
Int. Cl.² C10G 1/04
U.S. Cl. 208—11 LE 10 Claims

1. A method for the separation of the bitumen fraction from bitumen-bearing sands comprising:

a. adding the composition resulting from the mixing of an aqueous solution of tannic acid with an ammonium hydroxide solution to bitumen-bearing sands in quantities and concentrations and under condition of intimate contact just sufficient to result in a desired separation of the bitumen fraction from said sands.

3,953,318

METHOD OF REDUCING SLUDGE ACCUMULATION FROM TAR SANDS HOT WATER PROCESS

Robert A. Baillie, and James Van Dyck Fear, both of West Chester, Pa., assignors to Great Canadian Oil Sands Limited, Toronto, Canada

Filed Oct. 17, 1974, Ser. No. 515,776
Int. Cl.² C10G 1/04
U.S. Cl. 208—11 LE 2 Claims

1. An improved method for transferring effluent discharge recovered from hot water extraction of bitumen from tar sands to a retention pond comprising:

a. withdrawing pond sludge from said retention pond;

b. admixing said pond sludge with said effluent discharge; and

c. transferring said mixture to the retention pond.

3,953,319

PREPARATION OF REFRIGERATION OILS

Ralph P. Chesluk, Nederland; Howard J. Platte, Houston, and Edward C. Brink, Jr., Port Arthur, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 9, 1974, Ser. No. 504,617
Int. Cl.² C10G 23/00
U.S. Cl. 208—25 10 Claims

1. A process for the production of refrigeration oils which comprises contacting a crude petroleum lubricating oil with a hydrogenation catalyst in the presence of added hydrogen at a temperature between about 500 and 650°F. and a pressure between about 200 and 500 psig, treating the hydrofinished oil with concentrated sulfuric acid in an amount between about 15 and 60 pounds of acid per barrel of oil, removing waxy components from the acid-treated oil by complexing same with urea and separating the complex from the oil and percolating the dewaxed oil through a bed of clay.

3,953,320

CRACKING-ISOMERIZATION PROCESS

Reese A. Peck, Fishkill; Li C. Mih, Wappingers Falls, and John T. Brandenburg, Hopewell Junction, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed May 16, 1974, Ser. No. 470,687
Int. Cl.² C10G 13/02; B01J 29/22
U.S. Cl. 208—111 9 Claims

1. A process for improving the octane number of a hydrocarbon liquid fraction boiling below about 425°F. by a cracking-isomerization procedure which comprises contacting said fraction at a temperature between about 550° and 750°F. and a pressure between about 40 and 500 psig in the presence of added hydrogen with a catalyst comprising a noble metal on a support comprising at least 50% by weight acid-leached mordenite having a silica-alumina mol ratio of between about 40 and 80:1.

3,953,321

METHOD OF HYDRODESULFURIZING HEAVY PETROLEUM FRACTION IN THE INITIAL STAGE OF THE ON-STREAM PERIOD

Charles A. Ganster; Mary E. Callaghan, both of Port Arthur; Lee K. Gilmer; Gerald V. Nelson, both of Nederland, and Kenneth D. Miller, Port Neches, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 537,033
Int. Cl.² C10G 23/02
U.S. Cl. 208—216 13 Claims

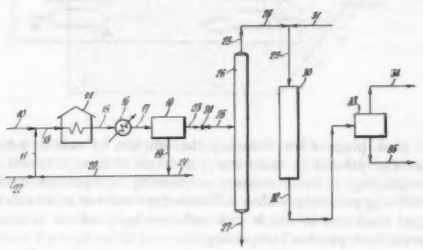
1. A process for the catalytic hydrodesulfurization of a heavy petroleum fraction having an initial boiling point of at least about 500°–650°F. which comprises contacting a hydrodesulfurization catalyst comprising a Group VI metal or compound thereof and an iron group metal or compound thereof supported on an inert refractory inorganic oxide selected from the group consisting of silica, alumina, magnesia, zirconia and mixtures thereof with hydrogen and with said heavy petroleum fraction at a temperature between about 750° and 850°F. for a period of at least about 12 hours, then reducing the tempeature of the reaction zone to between about 600° and 750°F. to institute the desulfurization on-stream period.

3,953,322

NON-CATALYTIC PROCESS FOR TREATING NAPHTHA CONTAINING OLEFINICALLY UNSATURATED COMPONENTS

John T. Nolan, Jr., Wappingers Falls, and Raymond F. Wilson, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed July 8, 1974, Ser. No. 486,532
Int. Cl.² C10G 31/08
U.S. Cl. 208—255 13 Claims



1. The process for treating a pyrolysis naphtha containing olefinically unsaturated components which comprises:

heating said pyrolysis naphtha in a non-catalytic reaction in the presence of water in amount of 20–200 parts by weight of water per 100 parts by weight of said naphtha, under pressure thereby polymerizing said olefinically unsaturated components, and forming a treated naphtha; and

recovering said treated naphtha.

3,953,323

PROCESS FOR REDUCTION OF OLEFINIC UNSATURATION OF PYROLYSIS NAPHTHA (DRIPOLENE)

John T. Nolan, Jr., Wappingers Falls, and Raymond F. Wilson, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,315
Int. Cl.² C10G 23/02; C07C 5/02
U.S. Cl. 208—255 12 Claims

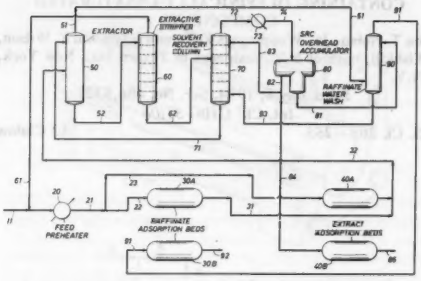
1. A process for treating pyrolysis naphtha for reduction of olefinic unsaturation, which process comprises:

treating pyrolysis naphtha with water in a ratio of from about 3:1 to about 0.5:1 at a temperature in the range of about 500°–700°F, at a superatmospheric pressure sufficient to maintain a substantial portion of the water in liquid phase, for a residence time of from about 12 minutes to about 10 hours in a reaction zone, and withdrawing a naphtha phase of reduced olefinic unsaturation from said reaction zone.

3,953,324
REMOVAL OF SOLVENT

Carl H. Deal, Houston, Tex., and Stephen H. Garnett, Tivon, Israel, assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 4, 1974, Ser. No. 529,430
Int. Cl.² C10G 21/22, 21/28
U.S. Cl. 208—321 6 Claims



1. A process for reducing the amount of sulfolane-type solvent present in the extract product stream obtained by contacting a liquid mixture containing compounds having differing polarities with a sulfolane-type solvent in an extraction zone and in which said sulfolane-type solvent is recovered, such process comprising:

a. contacting said extract product stream with a silica gel adsorbent at temperature T_1 wherein the sulfolane-type solvent entrained or otherwise present in said extract product stream is adsorbed onto the silica gel adsorbent thereby producing an extract product stream containing reduced amounts of sulfolane-type solvent; and

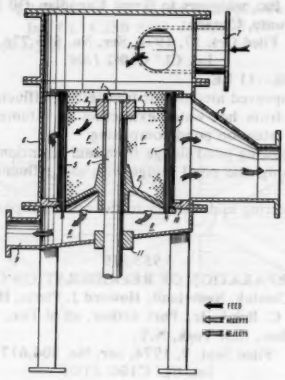
b. contacting the silica gel adsorbent and the sulfolane-type solvent adsorbed thereon with the liquid mixture feed to the extraction zone at temperature T_2 wherein temperature T_2 is greater than temperature T_1, thereby regenerating the silica gel adsorbent by displacing the sulfolane-type solvent adsorbed onto the silica gel adsorbent with the liquid mixture feed.

3,953,325
PULP SCREEN WITH ROTATING CLEANING FOIL

Douglas G. Nelson, 300 Glenvista Court, Centerville, Ohio 45459

Filed Sept. 27, 1972, Ser. No. 292,746
Int. Cl.² B07B 1/04
U.S. Cl. 209—273 14 Claims

14. In a particulate separating device having a housing with feedstock inlet and discharge chambers, a substantially cylindrical particulate screening member interposed between said inlet and discharge chambers to divide the discharge chamber into an acceptable particle discharge chamber remote from the inlet and a rejects particle discharge chamber on the inlet side of said screening member, a negatively pressurized hollow pulse foil member having a leading surface and a trailing surface mounted adjacent to the inlet surface of said screening member, said hollow foil member having an opening in said trailing surface adjacent the screening member for receiving reject particles from the inlet side of said screening member, means for rotating said hollow foil member across the adjacent surface of said screening member to separate reject particles from said surface, said hollow foil member being in communication with the reject particle discharge chamber, and a selective seal disposed between said inlet chamber and said rejects particle discharge chamber to restrict feedstock

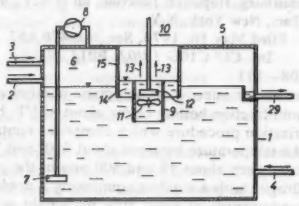


flow for particulate separation in the inlet chamber while permitting feedstock and reject particle discharge therefrom.

3,953,326
OXYGEN AERATION SYSTEM FOR CONTAMINATED LIQUIDS

Hans Reimann, Beethovenstrasse 21, 8023 Pullach, Germany

Filed July 24, 1974, Ser. No. 491,374
Claims priority, application Germany, July 26, 1973, 2338000; July 26, 1973, 2337999
Int. Cl.² C02C 1/06
U.S. Cl. 210—7 10 Claims



1. In a process for the purification of an organically contaminated liquid in an aeration tank in the presence of activated sludge, wherein a gas having a higher concentration of oxygen than air is introduced into an aeration tank containing a mixture of liquid and activated sludge, said tank having a zone containing at least the major part of the liquid, said zone further including above said liquid an atmosphere more enriched with oxygen than air, said atmosphere being substantially enclosed from the surroundings wherein said mixture of liquid and activated sludge are passed to a secondary settling tank to form a clarified liquid and an activated sludge fraction and wherein at least a portion of said fraction of activated sludge obtained from the secondary settling tank is recycled as return sludge into the aeration tank,

the improvement which comprises:

subjecting at least a portion of at least one stream to a stripping step with air to strip out CO_2 from said stream to prevent a buildup of CO_2 generated in said aeration tank to over a desired maximum which would otherwise lower the efficiency of the purification process, and to

maintain an essentially constant pH, said stream being at least one of: (a) the mixture of liquid and activated sludge before said mixture is settled into said clarified liquid and said activated sludge fraction and (b) said activated sludge fraction, said stripping step being conducted in a second zone separate from said zone including said at least the major part of the liquid and the substantially enclosed atmosphere more enriched with oxygen than air.

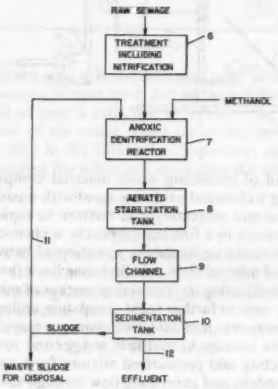
3,953,327
SEWAGE TREATMENT PROCESS

Denny S. Parker, Berkeley, Calif., assignor to Central Contra Costa Sanitary District, Walnut Creek, Calif.

Continuation of Ser. No. 354,804, April 26, 1973, abandoned. This application Aug. 29, 1974, Ser. No. 501,753

Int. Cl.² C02C *5/10*

U.S. Cl. 210—7 **9 Claims**



1. A process for treating sewage containing nitrogen compounds consisting essentially of the steps of first converting nitrogen compounds to the nitrate form by subjecting the sewage to nitrification, then subjecting the nitrified sewage to substantially anoxic denitrification in the presence of methanol, then stabilizing the denitrified sewage from the denitrification step by thoroughly aerating the sewage under conditions of agitation, then flowing said sewage from the stabilization step, then clarifying the flowing sewage to produce sludge and an effluent, recycling said sludge directly to said denitrification step to subject said sludge also to substantially anoxic denitrification, and withdrawing said effluent from the process.

3,953,328
SEPARATION OF SLUDGE

Wilhelm Aldag, 42 Ubierstrasse, D-532 Bad Godesberg-Bonn, Germany

Continuation of Ser. No. 276,033, July 28, 1972, abandoned. This application Sept. 4, 1974, Ser. No. 503,188

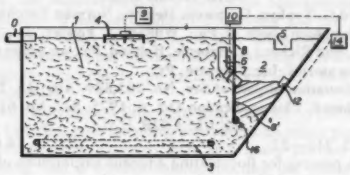
Claims priority, application Germany, Sept. 7, 1971, 2144605

Int. Cl.² C02C *1/08*

U.S. Cl. 210—7 **12 Claims**

1. A method for the separation of sludge, suspended material and the like from liquid to be purified, comprising the steps of causing the liquid to flow through an aeration chamber into a clarifying chamber; establishing a rising stream of liquid in the clarifying chamber in such a manner as to have a speed of flow which decreases as the liquid rises; permitting suspended microbiological and other material in the rising stream to undergo concentration in an intermediate zone of the clarifying chamber in which the tendency of the said material to sink owing to gravity is substantially the same as its tendency to be carried upwards in the stream; drawing off the concentrated material at the said intermediate zone by suction means and at least in part feeding it back to and introducing it to the upper zone of the aeration chamber; varying the disposition of the suction means to the level where the intermediate zone of concentration occurs; and carrying off the liquid of the rising stream from the clarifying chamber through an outlet at a level above the said zone.

3. An apparatus for use in separation of sludge, suspended material and the like from liquid to be purified, comprising: an aeration chamber provided with means for aerating liquid therein; a clarifying chamber in fluid communication with the aeration chamber for receiving the liquid therefrom in a rising stream and said clarifying chamber being so shaped that the



speed of flow of said stream decreases as the liquid rises; an outlet for clarified liquid disposed at an upper level of the clarifying chamber; at least one pump with an outlet disposed in the aeration chamber and with a suction pipe arranged with its inlet in the clarifying chamber at an intermediate level below the said outlet level and above the fluid communication between the two chamber, the level of the said suction pipe inlet being such that suspended microbiological and other material in the rising stream, which material concentrates at an intermediate zone where its tendency to sink owing to gravity is substantially the same as its tendency to be carried upwards in the stream, is drawn off from the clarifying chamber by the pump for at least partial return into an upper level of the aeration chamber; and means connected to said suction pipe providing that it may be displaceable to a desired intermediate level whereat said intermediate zone of concentrated material occurs.

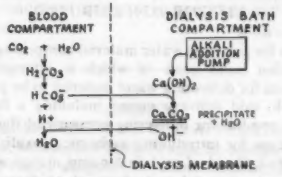
3,953,329
METHOD FOR DIALYZING CARBON DIOXIDE FROM BLOOD PLASMA

Stuart J. Updike, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation-in-part of Ser. No. 191,720, Oct. 22, 1972, Pat. No. 3,846,236. This application Oct. 5, 1972, Ser. No. 295,264

Int. Cl.² B01D *13/00;* **C12B** *1/00*

U.S. Cl. 210—22 R **10 Claims**



1. The method of removing carbon dioxide from whole blood by dialysis comprising the steps of bypassing the blood from the blood stream circulated through the human system, passing the bypassed blood into contact with one side of a hemodialysis membrane which allows for the dialysis while the

other side is wet by contact with an aqueous electrolyte containing an alkaline material in solution in an amount sufficient to make free hydroxyl ions available for transport through the membrane whereby carbon dioxide, which is formed in the blood and combines with water in accordance with the equation $H_2O + CO_2 \quad H_2CO_3 \quad HCO_3^- + H^+$ is removed from the blood stream by transport of bicarbonate ion through the membrane to the aqueous electrolyte while hydroxyl ions transport from the electrolyte through the membrane to neutralize hydrogen ions which remain in the blood, and in which the alkaline material is present in the electrolyte in an amount to maintain the normal level of blood pH in which the alkaline material is selected from the group consisting of an alkali metal hydroxide and an alkaline earth metal hydroxide.

3,953,330
WATER-SOLUBLE CATIONIC POLYMERIC MATERIALS AND THEIR USE

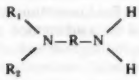
Richard G. Tonkyn, Cornwells Heights; Norman Vorchheimer, Buckingham, both of Pa.; William J. Fowler, Jr., Berlin, N.J., and Richard A. Heberle, Holland, Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 283,889, Aug. 25, 1972, abandoned. This application Oct. 6, 1975, Ser. No. 619,767

Int. Cl.² C02B *1/20*

U.S. Cl. 210—52 **14 Claims**

1. A process for flocculating aqueous suspensions of finely divided solids which comprises treating the suspension with an effective amount of a water-soluble cationic polymer to cause flocculation of said solids, said water soluble cationic polymer being obtained by the polymerization of an epihalohydrin with an alkylene polyamine having the formula



wherein R is a lower alkylene having from 2 to about 6 carbon atoms, and R_1 and R_2 are each a lower alkyl of from 1 to about 6 carbon atoms, the mole ratio of epihalohydrin to polyamine being from about 0.60:1 to about 2.7:1, said polymerization comprising reacting with the alkylene polyamine from about 50 to 90 percent of the amount of epihalohydrin to be polymerized, allowing the reaction to continue until the reaction medium attains a substantially uniform viscosity, and reacting the remaining portion of the epihalohydrin incrementally to obtain the cationic polymer, the temperature of polymerization being from about 60 to about 120° C.

3,953,331
STABILIZATION OF WASTE MATERIAL

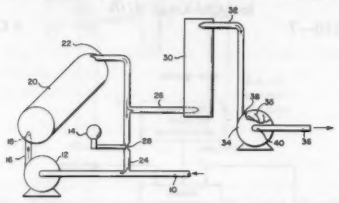
Earl H. Bradley, Seekonk, Mass., assignor to General Signal Corporation, Rochester, N.Y.

Continuation of Ser. No. 242,989, April 11, 1972, abandoned. This application Dec. 14, 1973, Ser. No. 424,990

Int. Cl.² C02B *1/34;* **E03B** *11/00*

U.S. Cl. 210—63 R **9 Claims**

1. A system for purifying water material comprising first and second reaction tanks each of which is internally unobstructed, means for delivering waste material to be purified to said first tank, said delivery means including a first pump means and a conduit for delivering pressurized fluid to said first tank, means for introducing a chemical oxidizing agent into the conduit ahead of said first pump means whereby a mixture of waste material and chemical oxidizing agent is pumped into said first reaction tank, first discharge conduit means from said first tank, said first discharge conduit means being directly connected to said delivery means and also to said second tank for recirculating a portion of said mixture though said first tank and for delivering the remaining portion of said mixture to said second tank, and means for maintaining pressure in said first and second tanks whereby a relatively rapid chemical oxidation reaction can occur during substantially the entire circulation of said mixture through said tanks, said means for maintaining pressure comprising second discharge conduit means connected to an outlet port of said second tank and further comprising impeller means in said second discharge conduit means for permitting said pressurized fluid to flow from said first pump means, through said first tank, said first discharge conduit means, said second tank, said outlet port, and said impeller means while simultaneously maintaining pressure in said first and second tanks, said impeller means comprising a rotatable impeller tending to oppose the flow of said fluid from said second tank while said first pump means delivers said pressurized fluid to said first tank.



8. A method of stabilizing waste material comprising the steps of mixing a chemical oxidizing agent with waste material to be stabilized and subjecting said mixture to rapid circulation under pressure in a first zone whereby a chemical oxidation reaction occurs, recirculating a portion of between 75% and 85% of said mixture from said first zone back through said first zone and subjecting the remaining portion of said mixture from said first zone to further rapid circulation under pressure in a second zone wherein said oxidation process continues, maintaining the mixture in said first and second zones under pressure, directing said pressurized mixture from said second zone into a conduit, and permitting flow through said first and second zones, said conduit and a rotatable impeller while simultaneously maintaining pressure in said zones by engaging said rotatable impeller in said conduit in a manner tending to oppose the flow of said mixture from said second zone to said conduit.

3,953,332
PURIFICATION OF WASTE WATER CONTAINING ORGANIC AND INORGANIC IMPURITIES

Sebastian Speth, Oberhausen; Georg Kuppenbender, Willich, and Willi Jansen, Oberhausen, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed June 27, 1974, Ser. No. 483,739

Claims priority, application Germany, July 3, 1973, 2333668

Int. Cl.² B01D *35/18*

U.S. Cl. 210—71 **7 Claims**

1. In a process for the separation of the components of a three phase system wherein:

A. One of the components is water;

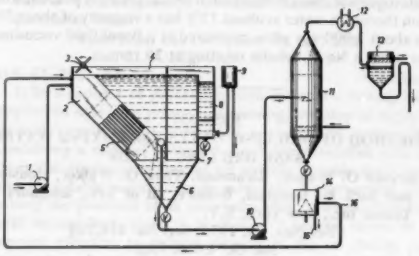
B. Another of the components is a water-insoluble organic liquid of lighter specific weight than said water, which liquid is in the form of a swimming sludge phase and comprises an aldehyde, an alcohol, a glycol, an ester or an addition or condensation product thereof; and

C. The third component is a solid which tends to flocculate when a heated mass containing the same is cooled,

by a process wherein a mixture containing such components A, B and C at elevated temperature is fed into the introduction zone of a tilted gravity separator and from there flows into a separation zone having a plurality of downwardly inclined tilted plates wherein said water-insoluble organic

liquid ascends said tilted plates and is removed and said water and said solids are separated from one another,

the improvement for decreasing the amount of petroleum ether soluble constituents in said water which comprises maintaining the temperature of the mass in the separation zone sufficient to prevent flocculation of said solids by



introducing into said introduction zone additional water of increased temperature and in such quantity that the amount of heat is sufficient to equalize the temperature decrease of the waste water occurring during the residence time in the tilted plate separator, and thereafter precipitating the solids and separating the solids from the water.

3,953,333

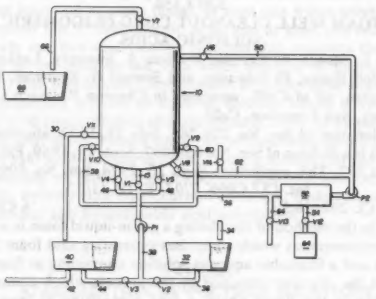
METHOD AND APPARATUS FOR REJUVENATING A BED OF GRANULAR FILTER MEDIUM

Gene Hirs, Birmingham, Mich., assignor to Hydromation Filter Company, Livonia, Mich.

Filed Apr. 21, 1975, Ser. No. 570,138

Int. Cl.² B01D *41/02*

U.S. Cl. 210—74 **16 Claims**



1. In a method of filtering particulate and lint-like contaminants from a dirty liquid by passing the dirty liquid through a bed of granular filter medium contained within a housing wherein the contaminants are accumulated and at least a portion of the particulate contaminants form an agglomeration with the filter granules, the improvement of renewing the bed of filter medium after the accumulation of an appreciable amount of contaminants therein, by the steps of: expanding and violently agitating the filter bed, thereby breaking up the agglomeration into filter granules and particulate contaminants; reforming the filter bed with the lint-like contaminants predominantly in the upper portion of the reformed bed, the larger of the broken-up particulate contaminants in the lowermost portion of the bed, and the remainder of the particulate contaminants interspersed throughout the bed; introducing diluting liquid into the bed at a position between the upper and lower surfaces of the bed; simultaneously (a) flowing a portion of the diluting liquid upwardly through only that portion of the bed which is above the point of diluting liquid introduction at an appreciable velocity to expand and to upwardly backwash interspersed particulates and lint-like contaminants therefrom; and (b) separately withdrawing from the housing at a point below the point of liquid introduction a slurry of granular filter material and interspersed particulates in admixture with the remainder of the diluting liquid, flowing the slurry in a continuous flow path which includes a cleaning element where at least a portion of the interspersed particulates are removed from the liquid mixture flow, and returning the withdrawn filter material back to the filter bed in the diluting liquid flow; terminating the diluting liquid flow after the filter bed has been sufficiently cleaned; and reforming the bed for further filtration flow of dirty liquid.

14. In a filtration apparatus having a bed of granular filter medium which is maintained in a filter housing during filtration flow, the improvement of a system for rejuvenating the filter bed after it has accumulated particulate and lint contaminants as a result of dirty liquid flow therethrough, said accumulated particulate contaminants becoming at least partially agglomerated due to the accumulation in the bed; said system including:

a closed recirculation flow path loop exterior to the housing, said flow path including an outlet at an upper portion of the housing, a return inlet at a lower portion of a housing, and a conduit interconnecting the outlet and return inlet;

liquid supply means for injecting diluent liquid into the bottom of the bed of granular filter medium at an appreciable velocity sufficient (a) to expand the bed, (b) to form a flowable slurry mixture of filter granules and contaminants, and (c) to flow the slurry out of the upper portion of the filter housing and into the closed recirculation flow path for agitating the mixture and breaking up at least a portion of the agglomerated particulates;

pump means in the recirculation flow conduit for returning the slurry to the filter housing through the recirculation inlet so that the bed may be reformed, the lint contaminants being interspersed in the upper portion of the reformed bed and the particulates interspersed throughout the filter bed;

a second closed flow path exterior to the housing forming a loop which includes (a) an outlet at the bottom of the housing, (b) a return inlet positioned above the bottom of the housing, (c) a flow conduit interconnecting the outlet and inlet, and (d) a cleaning element in the flow conduit;

means for injecting liquid into the conduit of the second flow path for flow through the return inlet at an appreciable velocity (a) to expand and substantially suspend that portion of the filter bed above the return inlet, (b) to flush particulate and lint contaminants from the expanded portion of the filter bed, (c) to flow filter granules and interspersed contaminants in a liquid mixture into the outlet of the second closed path, (d) to remove contaminants in a liquid flow at the cleaning element, and (e) to return the withdrawn granules to the filter housing from the second flow path after passing through the cleaning element.

3,953,334

FLUID FRACTIONATING APPARATUS

Robert Brun, Billene, and Michel Pages, St.-Martin-d'Ardeche, both of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed June 26, 1974, Ser. No. 483,361

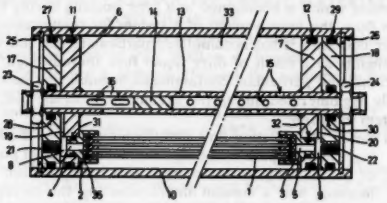
Claims priority, application France, June 27, 1973, 73.23481

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 R **13 Claims**

1. Fluid fractionating apparatus comprising in combination:

a. a jacket;
b. two side plates forming with said jacket a closed chamber;
c. an axial support pipe extending through said chamber by which said side plates are connected;
d. at least one aperture formed in each side plate;
e. a cap located at least partly in each said aperture so as to be detachable by movement towards the other side plate and defining a cavity communicating with the interior of the chamber and an orifice communicating the cavity with the exterior of the chamber, via the aperture in which the cap is at least partly located;
f. a plurality of flexible cords extending substantially axially in said chamber and each consisting of a textile sheath forming at least one channel, and a membrane covering



the textile sheath and being joined thereto at each of its ends in a leakproof manner, the flexible cords having an external diameter between 1 and 10 mm, the flexible cords being grouped against one another at least at their ends to form at least one bundle of substantially parallel flexible cords, one end of all the flexible cords of a bundle being located in a fluidtight manner in the cavity of one cap, while the other end of all the flexible cords of a bundle are located in a fluidtight manner in the cavity of another cap;
g. a stopper provided between the ends of the pipe, and blocking the flow of fluid directly through the pipe; and
h. a plurality of orifices in said pipe on each side of said stopper spaced along said pipe for feeding fluid to and from the chamber.

3,953,335

MAGNESIA STABILIZED ADDITIVES FOR NON-CLAY WELLBORE FLUIDS

Jack M. Jackson, P.O. Box 35221, Houston, Tex. 77035

Continuation-in-part of Ser. No. 101,123, Dec. 23, 1970, abandoned. This application Dec. 1, 1972, Ser. No. 311,274
The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.
Int. Cl.[2] C09K 7/00
U.S. Cl. 252—8.5 A **5 Claims**

1. An additive composition for non-clay brine wellbore fluids having improved viscosity stability and reduced water loss consisting essentially of water soluble non-ionic hydroxyethyl cellulose and a hydroxyethyl cellulose stabilizing amount of magnesia.

3,953,336

DRILLING FLUID

Armand E. Daigle, Maryland Heights, Mo., assignor to Amoco Production Company, Tulsa, Okla.

Filed Sept. 7, 1973, Ser. No. 395,329
Int. Cl.[2] C09K 7/02
U.S. Cl. 252—8.5 A **9 Claims**

1. A drilling fluid composition consisting essentially of a member selected from the group sea water and an aqueous sodium chloride solution, from about 10 to 20 lb/bbl of KCl, and an effective amount of a polymeric mixture to increase the viscosity of said composition, said mixture consisting essentially of hydroxyethylcellulose, and a heteropolysaccharide, produced by the bacterium *Xanthomonus campestris* NRRL B-1459, said mixture ranging in composition from about 80 percent hydroxyethylcellulose and 20 percent heteropolysaccharide to 20 percent hydroxyethylcellulose and 80 percent heteropolysaccharide, the molecular weight of said heteropolysaccharide being such that a 1 weight percent solution thereof in water at about 75°F has a viscosity of about 500 to about 3,000 cps when measured in a Brookfield viscosimeter using a No. 3 spindle rotating at 30 rpm.

3,953,337

METHOD OF DRILLING WELLS EMPLOYING WATER BASE DRILLING FLUIDS

Clarence O. Walker, Richmond; Thad O. Walker, Houston, and Jack H. Douglass, Bellaire, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 16, 1973, Ser. No. 416,701
Int. Cl.[2] C09K 7/02
U.S. Cl. 252—8.5 A **2 Claims**

1. In a method of drilling wells wherein a drilling fluid is passed through the well into contact with the earth formation during the drilling operation, the improvement which comprises contacting said earth formation with a low pH fresh water drilling fluid consisting essentially of clay solids dispersed therein by a clay-dispersing agent and sufficient alkali metal hydroxide to provide a pH of from about 9 to about 9.5 thereto, and wherein when said drilling fluid comes in contact with a sufficient amount of salt in said formation whereby its rheological properties are substantially impaired there is added to said drilling fluid a polyethylene glycol having an average molecular weight of from about 200 to about 500 in an amount of from about 0.5 to about 10 pounds per barrel of drilling fluid to restore the rheological properties of said drilling fluid.

3,953,338

FOAM WELL CLEANOUT USING OLIGOMERIC SULFONIC ACIDS

Alan E. Straus, El Cerrito; William A. Sweeney, Larkspur; Ralph House, El Sobrante, and Samuel H. Sharman, Kensington, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 276,265, July 28, 1972, abandoned, which is a division of Ser. No. 858,097, Sept. 15, 1969, Pat. No. 3,721,707. This application Sept. 25, 1974, Ser. No. 509,177
Int. Cl.[2] C09K 7/02; E21B 43/22
U.S. Cl. 252—8.5 C **6 Claims**

1. In the method of circulating a gas-in-liquid foam in a well the improvement which comprises generating said foam from a gas and a foamable aqueous solution containing as foaming agent the oligomer obtained by the process which comprises heating in the liquid phase a feed comprising at least one compound having a carbon atom content of at least 5 but less than 50 selected from the group of the formula

a) $RCH(CH_2)_xCHRSO_2$, (with a bridging O)
b) $RCH(OH)(CH_2)_xCHRSO_3H$, and
c) $RCH{=}CH(CH_2)_xCHRSO_3H$

wherein x is the number 0 and integers 1–3 and y is a whole number in the range 0–n wherein n is a number which is 4 less than the number of carbon atoms in the longest straight chain of the compound containing the $-SO_3H$ group as a substituent, and wherein the several R groups are the same or different and are hydrogen or alkyl hydrocarbon radicals; said heating being at a temperature above about 110°C and below the carbonization temperature of the feed, in the substantial absence of water, and for a period at least sufficient for a

significant conversion of the feed to the corresponding oligomeric disulfonic acids and circulating said foam in said well.

3,953,339

CONING OIL

James E. Obetz, Bernardsville, and Albert R. Tarini, Dover, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Sept. 14, 1973, Ser. No. 397,299
Int. Cl.² C10M *1/24*; D06M *13/20*
U.S. Cl. 252—8.9 11 Claims

1. In a process of processing yarn wherein a coning oil is applied to said yarn prior to processing, the step of applying to said yarn prior to processing a coning oil composition containing a mineral oil and at least one emulsifier selected from the group consisting of oil soluble anionic surfactants and oil soluble nonionic surfactants, the improvement comprising the presence of an aluminum soap of a saturated fatty acid having from about 8 to about 22 carbon atoms in an amount effective to reduce slinging of the oil during yarn processing wherein the composition is prepared by dispersing the soap in the mineral oil, heating to 110°C to clear, cooling to about 80°C, then introducing the emulsifier and agitating to obtain a compatible coning oil composition.

3,953,340

DISSOLVING SILICEOUS MATERIALS WITH SELF-ACIDIFYING LIQUID

Charles C. Templeton; Evan H. Street, Jr, and Edwin A. Richardson, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 411,139, Oct. 30, 1973, Pat. No. 3,828,854, and a continuation-in-part of Ser. No. 351,739, April 16, 1973, abandoned. This application May 3, 1974, Ser. No. 466,591
Int. Cl.² E21B *43/27*
U.S. Cl. 252—8.55 C 6 Claims

1. A self-acidifying liquid system which comprises a solution of at least one aqueous liquid, at least one water-soluble ammonium salt of hydrofluoric acid, and at least one relatively slowly reactive acid-yielding material that converts the solution of the fluoride salt to a water solution of hydrofluoric acid, with said solutes being present in proportions adapted to subsequently provide an aqueous solution having a hydrofluoric acid concentration of from about 0.2–5% by weight, a pH of at least about 2 and a capability of dissolving bentonite and with said acid-yielding material being a member of the group consisting of esters of aliphatic C_{1-5} alcohols and fatty C_{1-5} acids, hydrolyzable hydrocarbon chlorides, hydrolyzable acyl chlorides, and hydrolyzable acid anhydrides.

3,953,341

STABILIZATION OF POLYMER SOLUTIONS

Fred David Martin, McMurray, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,034
Int. Cl.² E21B *43/20*, *43/22*
U.S. Cl. 252—8.55 D 3 Claims

1. A process for the secondary or tertiary recovery of petroleum from subterranean formations penetrated by an injection well and a producing well which comprises introducing into said reservoir through said injection well a substantially oxygen free viscosity improving displacing medium to displace said petroleum from said subterranean formation, said displacing medium comprising water and a methylolated high molecular weight water-soluble copolymer of acrylamide and 2-acrylamido methylpropane sulfonic acid having a molecular weight of at least 200,000 wherein from about 0.1 to about 10 moles of formaldehyde is reacted for each mole of acrylamide in said polymer in order to increase the solution viscosity of the displacing medium.

3,953,342

PETROLEUM RECOVERY PROCESS

Fred David Martin, and Lawrence James Guilbault, both of McMurray, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed May 8, 1974, Ser. No. 468,036
Int. Cl.² E21B *43/20*, *43/22*
U.S. Cl. 252—8.55 D 3 Claims

1. A process for the secondary or tertiary recovery of petroleum from subterranean formations penetrated by an injection well and a producing well which comprises introducing into said reservoir through said injection well a substantially oxygen free displacing medium comprising water, a high molecular weight water-soluble polymer selected from the group consisting of partially hydrolyzed polyacrylamide and copolymers of acrylamide and 2-acrylamido methylpropane sulfonic acid and from about 0.1 to about 10 moles of glyoxal per mole of amide constituent of said polymer in order to increase the solution viscosity of said displacing medium.

3,953,343

BEARING MATERIAL

Harold E. Sliney, Parma, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 10, 1974, Ser. No. 513,611
Int. Cl.² C10M *5/00*, *7/00*
U.S. Cl. 252—12 12 Claims

1. A self-lubricating, oxidation-resistant composition of matter comprising:

a. a metal component capable of providing strength and elasticity to a temperature up to and in excess of about 930°C.;

b. a fluoride salt component capable of providing lubrication; and

c. a glass component capable of inhibiting oxidation of said metal component.

3,953,344

SURFACE TREATMENT COMPOSITION FOR METAL WORKING

Uraji Narushima, Yokohama, Japan, assignor to Nippon Paint Co., Ltd., Osaka, Japan

Filed July 25, 1974, Ser. No. 491,943
Claims priority, application Japan, Aug. 9, 1973, 48-89550
Int. Cl.² C10M *1/48*, *3/42*, *5/04*, *7/08*
U.S. Cl. 252—32.7 E 10 Claims

1. A surface treatment composition for metal working, which comprises 10 to 50 parts by weight of a water-soluble thermoplastic synthetic resin having an average degree of polymerization of 300 to 1,700, 40 to 180 parts by weight of an aqueous dispersion of an alkaline earth metal soap and 0.5 to 12 parts by weight of at least one volatile corrosion inhibitor.

3. The surface treatment composition according to claim 1, wherein the water-soluble thermoplastic synthetic resin is a member selected from the group consisting of a polyvinyl alcohol having a saponification degree of 75 % or more, an ammonium salt of a phosphatic esterified polyvinyl alcohol having an esterification degree of 25 to 75 %, a carboxy-polyvinyl alcohol having a carboxylation degree of the hydroxy group in the polyvinyl alcohol of 1 to 20 %, sodium polyacrylate, ammonium polyacrylate and calcium polyacrylate.

3,953,345

METHOD FOR THE PRODUCTION OF ACTIVATED CARBON SPHERES CONTAINING NITROGEN

Hatsuo Saito; Zenya Shiiki, and Masaaki Nakao, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed May 28, 1974, Ser. No. 473,708
Claims priority, application Japan, May 29, 1973, 48-59294
Int. Cl.[2] C01B *31/10, 31/02*
U.S. Cl. 252—423 17 Claims

1. A method for the production of activated carbon spheres comprising:

mixing 100 parts by weight of pitch having a softening point of not less than 70°C, an H/C ratio of not more than 1, and a nitrobenzene-insoluble content of not more than 40%, with 10–50 parts by weight of an aromatic hydrocarbon solvent compatible with the pitch and 2–50% by weight, based on the total weight of the pitch and aromatic solvent, of a nitrogen compound containing at least 10% by weight nitrogen and miscible with said pitch;

melting the mixture;

shaping the melted mixture into the form of spheres;

contacting the spheres with an organic solvent which is compatible with the aromatic solvent but which lacks affinity for the pitch to extract the aromatic solvent from the spheres, thereby forming micro-pores in the spheres;

contacting the microporous spheres with an aqueous or gaseous oxidizing agent to render them infusible; and

activating the infusibilized pitch spheres with an activating gas, to form activated carbon spheres containing 2–60% by weight nitrogen.

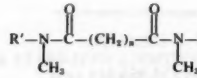
3,953,346

TERTIARY DIAMIDE LUBRICANTS

Robert M. Thompson, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

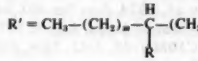
Continuation-in-part of Ser. No. 293,981, Oct. 2, 1972, abandoned. This application Oct. 17, 1974, Ser. No. 515,775
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 A 12 Claims

1. A lubricant composition comprising a major amount of at least one tertiary diamide having the formula:



wherein

n = 4–12



wherein

R = H, alkyl radical having C_1–C_5

m = 2–8

x = 1–5

and a minor amount of lubrication additive.

3,953,347

NOVEL SULFUR-CONTAINING COMPOSITIONS

Emile Najib Habiby, Willowick, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 178,803, Sept. 8, 1971, abandoned. This application Apr. 3, 1972, Ser. No. 240,795
Int. Cl.[2] C10M *1/38, 3/32;* C09B *49/00, 59/00*
U.S. Cl. 252—48.6 7 Claims

1. A sulfurized composition of matter prepared by reacting, at about 100°–250°C., sulfur with a mixture comprising (A) 100 parts by weight of at least one fatty acid ester of a polyhydric alcohol, (B) about 2–50 parts by weight of at least one fatty acid, and (C) about 25–400 parts by weight of at least one aliphatic α-olefin containing about 8–36 carbon atoms.

3,953,348

OIL-SOLUBLE REACTION PRODUCTS OF INTERMEDIATE (A) FROM A HIGH MOLECULAR WEIGHT OLEFIN POLYMER, ACETONITRILE, AND CHLORINE WITH (B) A PIPERAZINE, AND LUBRICANT COMPOSITIONS CONTAINING THE SAME

Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 426,722, Dec. 13, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,598
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51 7 Claims

1. The oil-soluble product prepared by the process comprising, preparing intermediate A by reacting from about 0.3 moles to about 2.5 moles of a high molecular weight olefin polymer having an average molecular weight of at least about 600, with from about 0.5 moles to about 7.5 moles of acetonitrile and from about 0.4 moles to about 2.0 moles of chlorine or bromine in the presence of a catalytic amount of iodine in the absence of light at a temperature of from about 60° to about 160°F. and thereafter reacting intermediate A with piperazine or with (b) an N-aminoalkyl-substituted piperazine at a temperature of from about 200° to about 350°F. for about 1–6 hours, said amine being used in an amount to provide sufficient amine groups to replace the halogen atoms in said intermediate (A).

5. A lubricant composition comprising a major amount of a normally liquid oleaginous lubricant, and from about 0.1 to about 10% of the oil-soluble product defined in claim 1.

3,953,349

OIL-SOLUBLE REACTION PRODUCTS OF (A) A HIGH MOLECULAR WEIGHT OLEFIN POLYMER, ACETONITRILE, AND CHLORINE WITH (B) AN AMINE, AND LUBRICANT COMPOSITIONS CONTAINING THE SAME

Richard J. Lee, Downers Grove, Ill., assignor to Standard Oil Company, Chicago, Ill.

Continuation-in-part of Ser. No. 426,722, Dec. 13, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,597
Int. Cl.[2] C10M *1/32*
U.S. Cl. 252—51 13 Claims

1. The oil-soluble product prepared by the process comprising, preparing intermediate A by reacting from about 0.3 moles to about 2.5 moles of a high molecular weight olefin polymer having an average molecular weight of at least about 600, with from about 0.5 moles to about 7.5 moles of acetonitrile and from about 0.4 moles to about 2.0 moles of chlorine or bromine in the presence of catalytic amount of iodine in the absence of light oil at a temperature of from about 60° to about 160°F. and thereafter reacting intermediate A with a primary or secondary aliphatic hydrocarbyl amine at a temperature of from about 200° to about 350°F. for about 1–6 hours, said amine being used in an amount to provide sufficient amine groups to replace the said halogen atoms in said intermediate A.

9. A lubricant composition comprising a major amount of a normally liquid oleaginous lubricant, and from about 0.1 to about 10% of the oil-soluble product defined in claim 1.

3,953,350
FOAMING BLEACHING COMPOSITION

Takashi Fujino, Yokohama; Masaaki Nishimura, Funabashi, and Makoto Yamanaka, Koganei, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,605
Claims priority, application Japan, Oct. 25, 1973, 48-120245
Int. Cl.² C11D *3/39, 7/54*
U.S. Cl. 252—94 **9 Claims**

1. Sodium percarbonate which has been heated at a temperature of from 75° to 135°C, for a heating time in the range of from (1) 2 to 6 hours at 75°C, to (2) 5 to 30 minutes at 135°C.

3. A bleaching composition consisting essentially of
1. from 30 to 90 weight percent of the sodium percarbonate of claim 1,
2. from 3 to 10 weight percent of water-soluble clothes-washing surfactant, and
3. from 6 to 30 weight percent of water-soluble inorganic builder and filler salts.

3,953,351
LIQUID LAUNDRY DETERGENT

Arnold Arie Keller, Maartensdijk, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Mar. 8, 1974, Ser. No. 449,411
Claims priority, application United Kingdom, Mar. 15, 1973, 12512/73
Int. Cl.² C11D *9/22*
U.S. Cl. 252—132 **3 Claims**

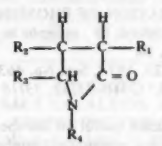
1. A liquid laundry detergent comprising 5–80% by weight of a liquid nonionic surface-active agent having a melting-/pour point of up to 25°C, 95–20% by weight of a fatty acid having a melting/pour point of up to 25°C, selected from the group consisting of saturated C_8-C_{22} fatty acids, unsaturated C_8-C_{22} fatty acids, and mixtures thereof, said fatty acid being neutralised to a degree of 0–40% to produce a water-soluble soap, and 0–20% by weight of water, said detergent having a pH within the range of 4 to 8.

3,953,352
ACIDIC CLEANING COMPOSITION

Hiroshi Mizutani, Yachiyo; Miwako Abe, Ichikawa, and Yumio Nakasone, Funabashi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

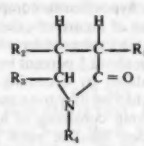
Filed May 31, 1974, Ser. No. 475,636
Claims priority, application Japan, June 4, 1973, 48-62821
Int. Cl.² C11D *3/28;* **C23G** *1/02*
U.S. Cl. 252—142 **6 Claims**

1. A liquid acidic cleaning composition for removing adherent soils and stains from hard surfaces and fabrics consisting essentially of (*a*) from 0.1 to 20 weight percent of at least one pyrrolidone-carboxylic acid compound having the formula:



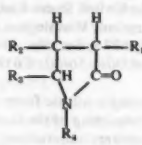
wherein R_1, R_2 and R_3, which can be the same or different, are hydrogen, —COOH, $—CH_3$, $—C_2H_5$ or —OH with the proviso that at least one of R_1, R_2 and R_3 is —COOH, and R_4 is hydrogen, $—CH_3$, or $—C_2H_5$, (*b*) up to 10 weight percent of anionic, cationic, nonionic, or ampholytic water-soluble surfactants effective to promote penetration of the cleaning composition for dispersing and emulsifying disloged soil, (*c*) up to 10 weight percent of mono-or di-ethylene glycol mono alkyl (C_1 to C_4) ethers, (*d*) up to 10 weight percent of hydrotropic agent selected from the group consisting of ethanol, propanol, ethylene glycol, propylene glycol, alkyl (C_1 to C_3) benzene sulfonates, urea and mixtures thereof, sufficient to dissolve (*a*), and (*e*) the balance is water.

5. A liquid cleaning composition for removing adherent soil and stains from hard surfaces and fabrics, consisting essentially of a. from 5 to 15 weight percent of hydrochloric acid, b. from 0.1 to 20 weight percent of at least one pyrrolidone carboxylic acid compound having the formula:



wherein R_1, R_2, and R_3, which can be the same or different, are hydrogen, —COOH, $—CH_3$, $—C_2H_5$ or —OH with the proviso that at least one of R_1, R_2 and R_3 is —COOH, and R_4 is hydrogen, $—CH_3$, or C_2H_5, c. up to 10 weight percent of hydrotropic agent selected from the group consisting of ethanol, propanol, ethylene glycol, propylene glycol, alkyl (C_1 to C_3) benzene sulfonates, urea and mixtures thereof, sufficient to dissolve (b), and d. the balance is water.

6. A solid acid cleaning composition for removing adherent soils and stains from hard surfaces and fabrics, consisting essentially of a. from 0.1 to 50 weight percent of at least one carboxylic acid compound having the formula:



wherein R_1, R_2 and R_3, which can be the same or different are hydrogen, —COOH, $—CH_3$, $—C_2H_5$ or —OH with the proviso that least one of R_1, R_2 and R_3 is —COOH, and R_4 is hydrogen, $—CH_3$ or C_2H_5, and b. the balance is at least one substance selected from the group consisting of sodium chloride, sodium sulfate, sodium bisulfate and potassium bisulfate.

3,953,353
LAUNDERING PRE-SPOTTER AND METHOD OF PRODUCTION

John H. Barrett, Jr., La Mirada, and Brian P. Flynn, Long Beach, both of Calif., assignors to Purex Corporation, Lakewood, Calif.

Filed Nov. 8, 1974, Ser. No. 521,969
Int. Cl.² C11D *17/00*
U.S. Cl. 252—174 **17 Claims**

1. For rub-on application to stains and soil deposits on fabrics preparatory to laundering, the solid product consisting essentially of water soluble nonionic detergent and stable laundry enzyme uniformly dispersed therein, said product being characterized as having ASTM Penetrometer hardness between about 4.5 mm and 10.5 mm measured using a standard needle with 50 gram load.

3,953,354

ENCAPSULATED CALCIUM HYPOCHLORITE GRANULES

John P. Faust, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 150,782, June 7, 1971, abandoned. This application June 27, 1973, Ser. No. 374,153

Int. Cl.² C01B *11/06;* **C11D** *3/395*

U.S. Cl. 252—187 H **17 Claims**

1. A granular calcium hypochlorite composition in which each granule is comprised of a core of calcium hypochlorite containing at least about 65 percent by weight of calcium hypochlorite and less than about 5 percent by weight of water, said core being encapsulated by a coating comprised of a mixture of calcium hypochlorite dihydrate and a water soluble salt selected from the group consisting of alkali metal chlorides, alkali metal nitrates, alkaline earth metal chlorides, alkaline earth metal nitrates, and mixtures thereof, said water soluble salt being nonreactive with and stable to said calcium hypochlorite, said coating comprising from about 5 to about 60 percent by weight of said granule, the proportion of said water soluble salt in said coating ranging from about 0.1 to about 15 percent by weight of said granule, and the proportion of said calcium hypochlorite dihydrate in said coating ranging from about 4 to about 50 percent by weight of said granule.

3,953,355

PREPARATION OF URANIUM NITRIDE

Ralph A. Potter, Lynchburg, Va., and Victor J. Tennery, Upper Arlington, Ohio, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 29, 1974, Ser. No. 474,284

Int. Cl.² C01G *43/00, 56/00;* **C01F** *15/00*

U.S. Cl. 252—301.1 R **4 Claims**

1. A process for producing a nitride from an actinide metal selected from the group consisting of thorium, uranium, (uranium, plutonium), plutonium, americium, and neptunium comprising the steps of:

heating said metal within a reaction chamber containing a non-reactive atmosphere to a temperature within the range of 450° to 550° C.;

admitting hydrogen to said reaction chamber;

cooling said metal to a temperature at which partial hydriding of said metal occurs;

admitting nitrogen to said reaction chamber so as to flush out said hydrogen;

heating said reaction chamber through a temperature range in which dehydriding and nitriding occur;

maintaining the temperature within said last-mentioned temperature range until nitrogen is substantially no longer consumed;

cooling said reaction chamber to said hydriding temperature;

reheating said reaction chamber to said temperature range in which dehydriding and nitriding occur; and

repeating the above steps until substantially all of said metal is converted to a nitride.

3,953,356

METHOD OF PRODUCING GASEOUS MIXTURE RICH IN HYDROGEN

Tadayoshi Tomita, Kanagawa, Japan, assignor to Toyo Engineering Corporation, Tokyo, Japan

Continuation of Ser. No. 244,549, April 17, 1972, abandoned. This application Apr. 22, 1974, Ser. No. 462,929

Claims priority, application Japan, Apr. 19, 1971, 24480/71

Int. Cl.² C01B *2/02, 2/16*

U.S. Cl. 252—373 **2 Claims**

1. In a process for producing gaseous mixtures rich in hydrogen from a feedstock of normally liquid hydrocarbons, in which said feedstock is catalytically partially oxidized by an oxidizer selected from the group consisting of oxygen, oxygen-rich air and air in the presence of steam wherein the molar ratio of steam to carbon in said feedstock is 0.5 to 10.0 at a temperature of from higher than 850° to 1000°C, at a pressure in the range of one to 300 atmospheres, at a space velocity of from 500 to 4000/hr, in the presence of a catalyst, the improvement wherein said catalyst is a sintered catalyst consisting of:

from more than 20 percent by weight to 60 percent by weight of calcium oxide,

less than 1.0 percent by weight of silicon dioxide,

less than 3.0 percent by weight of other inorganic contaminants of oxides of metals higher than Group V of the Periodic Table, and

the balance is aluminum oxide.

3,953,357

VERMICULITE PRODUCTS PRODUCED BY EXFOLIATION PULVERIZATION AND CALCINATION

Ian Preston, Johannesburg, South Africa, and John Charles Davidtz, Hopewell, N.J., assignors to Mandoval Vermiculite (Proprietary) Limited, Johannesburg, South Africa

Continuation-in-part of Ser. No. 271,932, July 14, 1972, abandoned. This application Mar. 14, 1974, Ser. No. 451,125

Claims priority, application South Africa, July 15, 1971, 71/4705

Int. Cl.² B01J *21/16;* **B01D** *39/06;* **B28D** *1/32;* **C04B** *31/26*

U.S. Cl. 252—378 R **8 Claims**

1. A method for preparing an improved vermiculite product, which is especially suitable as a filter aid, which comprises

subjecting crude vermiculite to a temperature sufficient to cause exfoliation;

pulverizing the exfoliated vermiculite to a particle size of less than about 200 microns;

heating the pulverized exfoliated vermiculite particles to a temperature and for a time sufficient so that the temperature of the particles themselves is at least 600°C to cause at least partial calcination; and

recovering the partially calcined vermiculite.

3,953,358

MELTS OF POLYHYDRIC ALCOHOLS AS STABILIZERS FOR VINYL CHLORIDE POLYMERS

Carl-Axel E. Sjögreen, Perstorp, Sweden, assignor to Perstorp AB, Perstorp, Sweden

Filed Oct. 16, 1973, Ser. No. 406,936

Claims priority, application Sweden, Nov. 13, 1972, 14680/72

Int. Cl.² C09K *15/06;* **C08L** *91/00;* **C08K** *9/00, 5/05*

U.S. Cl. 252—407 **3 Claims**

1. A vinyl chloride polymer containing as a stabilizer the solid product obtained by melting together trimethylol propane and pentaerythritol.

3,953,359

DETERMINATION OF PHOSPHORUS

E. Melvin Gindler, Rockford, Ill., assignor to Pierce Chemical Company, Rockford, Ill.

Filed Apr. 23, 1974, Ser. No. 463,405

Int. Cl.² G01N *31/22, 33/16*

U.S. Cl. 252—408 **17 Claims**

1. In an aqueous solution useful for the spectrophotometric determination of inorganic phosphorus containing a reducing agent effective to reduce a phosphomolybdate complex to yield its characteristic blue color, the improvement wherein the solution also contains a water soluble long chain hydrocarbon amine ethyleneoxide adduct or quaternized derivative thereof which is cationic in acid solution and contains lipophilic and hydrophilic nonionic groups, said adduct or quaternized derivative thereof being present in an amount sufficient to prevent protein precipitation when said solution also contains protein, molybdic acid and a phosphomolybdate complex.

3,953,360

PREPARATION OF SELECTIVE ADSORBING PARTICLES

Masataka Morishita; Mitsuru Fukushima, and Yoshihito Inaba, all of Shizuoka, Japan, assignors to Toyo Jozo Company, Ltd., Japan

Filed Mar. 19, 1974, Ser. No. 452,530

Claims priority, application Japan, Mar. 19, 1973, 48-32048

Int. Cl.² B01J *31/06*

U.S. Cl. 252—428 **7 Claims**

1. A selective adsorbing particle, having an outer diameter from 100 to 5000 microns, consisting of activated charcoal powders and a polymer matrix, said polymer matrix being made of a polymer selected from the group consisting of ethyl cellulose, cellulose acetate, cellulose acetate phthalate, nitro cellulose, hydroxypropylmethyl cellulose phthalate, polyvinyl chloride, polyvinyl formal, polyvinyl butyral, vinyl chloride-vinyl acetate copolymer, vinyl acetate-vinyl propionate copolymer, polyacrylonitrile, polymethacrylonitrile, polydimethylamino ethyl methacrylate, polystyrene, and a mixture thereof, and having a structure that consists of an outer permeable barrier layer of from about 0.5 to 5 microns in thickness having a plurality of micropores from 10 to 50 angstroms in diameter and of a macroporous polymer gel matrix continuous to said barrier layer, said activated charcoal powders being dispersed inner side of said polymer gel matrix in an amount from 20 to 80% by weight based on the dry weight of said particle, and said particle having a void volume equal to at least 25% of the total volume thereof.

3,953,361

METHOD OF MANUFACTURING GRANULAR SOLID CATALYST

Hiroshi Isa; Toshiyuki Ukigai, both of Yachiyo; Anry Tominaga, Tokyo; Ryozo Taniyasu, Narashino, and Masuzo Nagayama, Tokyo, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1974, Ser. No. 527,644

Claims priority, application Japan, Dec. 14, 1973, 48-138784

Int. Cl.² B01J *31/02*

U.S. Cl. 252—429 R **12 Claims**

1. A process for preparing a granular solid catalyst, which comprises: reacting at a temperature of more than 60° C, a reaction mixture consisting essentially of

a. an α-olefin or internal olefin having 3 or more carbon atoms, or mixtures thereof,

b. an aluminum halide, and

c. a ketone selected from the group consisting of methyl ethyl ketone, diethyl ketone, diisobutyl ketone, dioctyl ketone, acetyl acetone, cyclohexanone and pyruvic acid esters

wherein the reaction mixture contains from 1.0 to 1.20 moles of said ketone (c) and more than one mole of said olefin (a), per one mole of said aluminum halide (b),

until there precipitates a granular solid catalyst having a particle size in the range of about 0.1 to 2.0 mm.

3,953,362

MOLYBDENUM SALT CATALYSTS AND METHODS OF PREPARING THEM

Ellwood L. Lines, Westville; John A. Herbst, Madison, and Robert J. Fairbrother, Wallingford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Apr. 30, 1975, Ser. No. 573,293

Int. Cl.² B01J *31/12*

U.S. Cl. 252—431 N **32 Claims**

1. A method of preparing a molybdenum salt catalyst, comprising:

reacting at elevated refluxing temperatures an oxygen-containing molybdenum compound selected from the group consisting of molybdenum dioxide, molybdenum sesquioxide, molybdenum trioxide and the ammonium salt of molybdic acid, and mixtures thereof with about 0.1 to about 4 moles of hydrogen peroxide per mole of molybdenum and about 0.1 to about 4 moles of an amine per mole of molybdenum, the amine being (a) a compound of the formula $R_1R_2R_3N$ wherein R_1, R_2, and R_3 are each independently selected from hydrogen, unsubstituted alkyls having about 1 to about 10 carbon atoms, and unsubstituted aryls having about 6 to about 10 carbon atoms, with the proviso that at least one of R_1, R_2, and R_3 is not hydrogen, or (b) an N-oxide of a tertiary amine compound of the above formula.

3,953,363

CATALYST FOR PURIFYING EXHAUST GASES

Shin Yamauchi, Ikeda; Koshi Horie, Suita; Tetsuji Ono, Amagasaki, and Takashi Ohara, Nishinomiya, all of Japan, assignors to Nippen Shokubai Kogaku Kogyo Co. Ltd., Osaka, Japan

Filed Feb. 11, 1974, Ser. No. 441,627

Claims priority, application Japan, Feb. 14, 1973, 48-17415

Int. Cl.² B01J *23/46, 23/72, 23/74*

U.S. Cl. 252—443 **9 Claims**

1. A catalyst for removing nitrogen oxides, carbon monoxide and hydrocarbons from an exhaust gas consisting essentially of, as active components, nickel, copper and at least two noble metals selected from iridium, rhodium and ruthenium, supported on a carrier,

the atomic weight ratio of copper to nickel being 0.2 to 5 to 1;

the atomic weight ratio of the sum of copper and nickel to the sum of the noble metals being 10 to 100,000 to 1; and

the total weight of copper and nickel being 10 to 200 grams per liter of the catalyst, said catalyst being prepared by the steps comprising

a. adding a carrier to a mixed aqueous solution of water-soluble salts of copper and nickel;

b. drying the product of step (a);

c. calcining the dried mixture of step (b);

d. immersing the calcined product of step (c) in an aqueous solution of a salt or an acid of at least two metals selected from the group consisting of iridium, rhodium and ruthenium;

e. drying the product of step (d); and

f. reducing the dried product of step (e) in a reducing atmosphere at a temperature of 300° to 600°C.

to thereby obtain the catalytic product.

3,953,364

THERMACTIVATION OF CATALYSTS COMPRISING CATALYTIC METALS-FREE CRYSTALLINE ZEOLITIC MOLECULAR SIEVE PARTICLES DISPERSED IN A GEL MATRIX

Joseph Jaffe, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 757,503, Sept. 4, 1968, abandoned. This application July 29, 1970, Ser. No. 64,099

Int. Cl.² B01J *29/06;* **C10G** *13/02*

U.S. Cl. 252—455 Z **4 Claims**

1. A catalyst composite comprising:

A. A gel matrix comprising:

a. at least 15 weight percent silica,

b. alumina, in an amount providing an alumina-to-silica weight ratio of 15/85 to 80/20,

c. nickel or cobalt, or the combination thereof, in the form of metal, oxide, sulfide, or any combination thereof, in an amount of 1 to 10 weight percent of said matrix, calculated as metal,

d. molybdenum or tungsten, or the combination thereof, in the form of metal, oxide, sulfide, or any combination thereof, in an amount of 5 to 25 weight percent of said matrix, calculated as metal;

B. A crystalline zeolitic molecular sieve substantially in the ammonia or hydrogen form, substantially free of any catalytic loading metal or metals, said sieve further being in particulate form and being dispersed through said matrix;

said catalyst composite being further characterized by an average pore diameter below 100 Angstroms and a surface area above 200 square meters per gram;

said catalyst composite being further characterized by hydrocracking activities and stabilities developed therein by heating said catalyst composite in an oxygen-containing gas stream at temperatures in the range 1200°F. to 1600°F. for 0.25 to 48 hours.

3,953,365

CATALYST FOR DEHYDROCYCLIZATION OF PARAFFINS

Masayoshi Oishi, Wilmington, Del., assignor to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 356,002, April 30, 1973, abandoned, which is a division of Ser. No. 250,991, May 8, 1972, Pat. No. 3,775,502. This application Aug. 22, 1974, Ser. No. 499,695

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **3 Claims**

1. A catalyst consisting essentially of sodium zeolite X or sodium zeolite Y which zeolite contains from 0.10 to 1.2 weight percent platinum having a dispersion of at least 50% and less than 0.10 weight percent chlorine and is substantially free of acid zeolite sites.

3,953,366

CATALYST FOR THE PRODUCTION OF AROMATIC COMPOUNDS

Roger A. Morrison, West Deptford Township, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 300,546, Oct. 25, 1972, Pat. No. 3,855,115. This application Sept. 9, 1974, Ser. No. 504,573

Int. Cl.² B01J *29/06*

U.S. Cl. 252—455 Z **2 Claims**

1. A catalyst comprising a ZSM-5 synthetic aluminosilicate zeolite molecular sieve having incorporated therewith 0.1 to 5 weight percent zinc and having exchanged thereinto rhenium in a proportion of about 0.05 to 5 with respect to said zinc.

3,953,367

METHOD OF PRODUCING A RANEY COPPER CATALYST AND THE CATALYST SO MADE

Karl H. Hoffmann, Brookfield; Donald R. Anderson, Oswego, and Darrell L. Werges, Park Forest, all of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed June 28, 1974, Ser. No. 484,177

Int. Cl.² B01J *21/04, 23/72*

U.S. Cl. 252—463 **29 Claims**

1. In an improved process for preparing a Raney copper catalyst comprising from about 2 to 45 weight percent aluminum and the balance up to 100 weight percent being copper, the improvement which comprises contacting particles of a metal alloy comprised of copper and aluminum with an aqueous solution which has dissolved therein on a 100 weight percent total by-product free solution basis from greater than 0 to about 25 weight percent alkali metal hydroxide and at least one soluble polyhydroxylated material selected from the group consisting of monosaccharide, disaccharide and polysaccharide said polyhydroxylated material having a solubility in water of at least about 5 weight percent, and having a molecular weight of less than about 1,000, said contacting being conducted at a temperature below about 80° C.

3,953,368

POLYMETALLIC CLUSTER COMPOSITIONS USEFUL AS HYDROCARBON CONVERSION CATALYSTS

John H. Sinfelt, Berkeley Heights, N.J., assignor to Exxon Research and Engineering Co., Linden, N. J.

Continuation-in-part of Ser. No. 194,461, Nov. 1, 1971, Pat. No. 3,850,747, which is a continuation-in-part of Ser. No. 883,601, Dec. 9, 1969, abandoned. This application July 30, 1974, Ser. No. 493,105

Int. Cl.² B01J *21/04, 23/42, 23/46*

U.S. Cl. 252—466 PT **19 Claims**

1. A catalyst composition comprising:

polymetallic clusters of iridium and at least one additional metal selected from the group consisting of ruthenium, rhodium, palladium, osmium, platinum, copper, silver, gold and mixtures thereof, dispersed on a refractory support,

the iridium being present in the overall catalyst composition in an amount greater than 0.1 wt. %, each additional metal being present in an amount of 0.1 to 1.0 wt. %,

the metal dispersion, defined as the percentage of metal atoms in the clusters which are present on the surface, being greater than about 20%,

the average atomic ratio of iridium to each additional metal in the overall catalyst varying from about 1 : 10 to 10 : 1,

the metallic atoms within a cluster being separated by distances of about 2.5 to 4.0A, and

the degree of coverage of the surface of the refractory support by the polymetallic clusters being less than about 10%.

3,953,369

METHOD FOR THE PRODUCTION OF A PLATINUM CATALYST USED FOR PURIFICATION OF EXHAUST AND WASTE GASES

Takashi Ohara, Nishinomiya; Tetsuji Ono, Amagasaki; Shoichi Ichihara, Toyonaka, and Koichi Saito, Suita, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Apr. 2, 1974, Ser. No. 457,209

Claims priority, application Japan, Apr. 6, 1973, 48-38643

The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.² B01J *23/40, 23/42*

U.S. Cl. 252—472 **17 Claims**

1. A method for the production of a platinum catalyst used for purification of exhaust and waste gases comprising depositing platinum on to a porous inorganic refractory support by impregnating said support with an aqueous medium consisting of dinitrodiamine platinum in the presence of at least one poly (oxyethylene) type nonionic surface active agent of an average molecular weight of at least 500, selected from the group consisting of poly(oxyethylene) glycols, poly(oxyethylene) alkyl ethers, poly(oxyethylene) alkylaryl ethers, poly(oxyethylene)-alkyl esters, poly(oxyethylene) alkylamines, poly(oxyethylene)-alkylamides, fatty acid esters of poly(oxyethylene)sorbitanes and poly(oxyethylene)-poly(oxypropylene) block copolymers, drying the resulting impregnated support and subjecting it to calcination or reduction.

3,953,370

METHOD OF ACTIVATING ZINC FERRITE OXIDATIVE DEHYDROGENATION CATALYSTS

Edward J. Miklas, Conroe, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Oct. 16, 1974, Ser. No. 515,235

Int. Cl.² B01J *23/80;* **C07C** *5/48*

U.S. Cl. 252—473 **2 Claims**

1. A process for activating zinc ferrite oxidative dehydrogenation catalyst comprising

depositing a particulate mass comprising zinc ferrite in a fixed bed, and

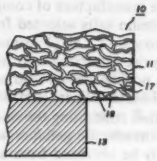
intimately contacting said zinc ferrite with a continuous stream consisting of steam having a temperature in the range of 700° to 1300°F. for a period of time to activate said zinc ferrite.

3,953,371

CONTROLLED GRAIN SIZE METAL OXIDE VARISTOR AND PROCESS FOR MAKING

John E. May, Skaneateles, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Nov. 12, 1973, Ser. No. 414,714
Int. Cl.² H01B 1/08
U.S. Cl. 252—512 12 Claims



1. A varistor comprising a sintered body portion consisting essentially of layered granular material of a controlled grain size, said granular material consisting essentially of zinc oxide, said body portion comprising grain growth inhibitor means in an intergranular phase bounding the grains.

7. A process for manufacturing a metal oxide varistor comprising the steps of:

providing a granular metal oxide powder consisting primarily of zinc oxide with a small amount of at least one preselected additive dispersed substantially evenly therethrough;

combining said metal oxide powder with a grain growth inhibitor to form a final mix with peripheral regions containing a relatively high concentration of said grain growth inhibitor surrounding and separating interior regions which contain low concentrations of said grain growth inhibitor; and,

pressing and sintering a varistor pellet with a portion of said final mix, said substep of sintering stimulating substantial grain growth in each of said interior regions.

3,953,372

PREPARATION OF EXTRINSIC SEMICONDUCTORS FOR ELECTRIC HEATING

Janina Gurzynska, Koszalin, and Korneliusz Wesolowski, Warsaw, both of Poland, assignors to Huta Szkla im.Pablinskiego Przedsiebiorstwo Panstwowe, Wolomin, Poland

Filed June 13, 1973, Ser. No. 369,610
Claims priority, application Poland, June 17, 1972, 156060
Int. Cl.² H01B 1/06
U.S. Cl. 252—518 3 Claims

1. The method of preparing a composition, for use as a transparent resistive coating on an insulating substrate, in which the coating can withstand a power loading of 20 watts per square centimeter, said method comprising:

combining a major coating component, comprised of stannic chloride, antimony trichloride and ammonium fluoride;

combining a minor thermoelectric buffer component, comprised of cupreous oxide, boric acid and cadmium chloride;

separately melting each of the resulting components;

intimately mixing the two melts;

freezing the resulting composition;

crushing the resulting frozen composition;

remelting the crushed composition;

refreezing the remelted composition; and

recrushing the thus processed composition.

3,953,373

VOLTAGE-DEPENDENT RESISTOR

Mikio Matsuura; Osamu Makino; Nobuji Nishi, all of Hirakata, and Michio Matsuoka, Ibaragi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 18, 1974, Ser. No. 489,827
Claims priority, application Japan, July 20, 1973, 48-81711; Sept. 4, 1973, 48-100047; Sept. 4, 1973, 48-100048; Sept. 4, 1973, 48-100050
Int. Cl.² H01B 1/08
U.S. Cl. 252—518 6 Claims

1. A voltage-dependent resistor of the bulk type comprising a sintered body consisting essentially of 0.1 to 5.0 mole percent of bismuth oxide (Bi_2O_3) and 0.01 to 5.0 mole percent of germanium oxide (GeO_2), the remainder being zinc oxide and electrodes applied to opposite surfaces of said sintered body.

3,953,374

ONE-PASS ELECTROCONDUCTIVE COATING COLOR FORMULATION

Robert H. Windhager, Pittsburgh, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Feb. 19, 1974, Ser. No. 443,272
Int. Cl.² H01B 1/06, 1/00
U.S. Cl. 252—518 12 Claims

1. A method for enhancing the solvent holdout properties of electroconductive coating color formulations containing from 15 to 50% by weight of a water soluble electroconductive polymer, from 30 to 70% by weight of a water soluble, non-conductive film-forming polymeric binder, and from 10 to 60% by weight of a pigment which comprises adding to such formulations from 0.5 to 10% by weight of mono- and bis-(1H,1H,2H,2H-perfluoroalkyl)-phosphate esters of the formula:

$$(C_mF_{2m+1}C_nH_{2n}O)_yPO(OM)_{3-y}$$

wherein m is an integer between 4 and 10, n is an integer between 1 and 11, y is 1 or 2 and M is a water solubilizing cation selected from the group consisting of an alkali metal, ammonium or substituted ammonium.

3,953,375

NON-LINEAR VOLTAGE TITANIUM OXIDE RESISTANCE ELEMENT

Takahiro Nagano, and Michio Oue, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1974, Ser. No. 441,318
Claims priority, application Japan, Feb. 9, 1973, 48-15496
Int. Cl.² H01B 1/06; H01C 1/06
U.S. Cl. 252—520 15 Claims

1. A non-linear voltage resistant element comprising a sintered body of a powdered metal oxide mixture, said mixture consisting essentially of 0.05 to 10 molar % of bismuth trioxide, 0.05 to 3 molar % of niobium pentaoxide, and the remainder being titanium oxide, said body being sintered at a sintering temperature no higher than the melting point of titanium oxide and no lower than a temperature at which a melt of metal oxides is produced in an oxidizing or non-oxidizing atmosphere.

13. A titanium oxide base non-linear voltage resistance element comprising a formed and sintered body of metallic oxide powder, said metallic oxide powder consisting of bismuth trioxide powder of 0.05 to 10 molar %, niobium pentaoxide powder of 0.05 to 3 molar %, and titanium oxide powder in quantity of the remainder of said metallic oxide powder, and said body being sintered at 1000° to 1400°C. in a non-oxidizing atmosphere wherein the stoichiometric bond-

ing ratio of oxygen atoms to titanium atoms in titanium oxide contained in the sintered body is less than 2.

3,953,376

METHOD FOR PREPARING EMISSIVE COATING FOR ELECTRODES

Edmund R. Kern, Hampton, N.H., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 10, 1974, Ser. No. 487,409

Int. Cl.² H01B 1/06

U.S. Cl. 252—521 **2 Claims**

1. A method for preparing electron emissive coating for electrical gas discharge devices comprising the following steps:

combining barium carbonate with tantalum pentoxide in the ratio of $5BaCO_3$ to $1Ta_2O_5$;

milling the mixture in a suspension of methyl alcohol for obtaining a homogeneous suspension therein;

drying the suspension and heating for one hour at 800°C and for 2 hours at 1200°C;

cooling and grinding to a powder form; and

adding 5 to 25% calcium carbonate and suspending in a solution of nitrocellulose and amyl acetate in order to provide a coating suspension.

3,953,377

ETHYL-2-TRANS-4-CIS UNDECADIENOATE, ETHYL-2-TRANS-4-CIS DODECADIENOATE AND ETHYL-2-DECADIENOATE PERFUME COMPOSITIONS

Ferdinand Naf, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

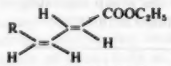
Division of Ser. No. 210,620, Dec. 21, 1971, Pat. No. 3,928,402. This application Aug. 27, 1974, Ser. No. 501,194

Claims priority, application Switzerland, Dec. 22, 1970, 19018/70; Apr. 29, 1971, 6354/71

Int. Cl.² C11B 9/00

U.S. Cl. 252—522 **4 Claims**

1. A process for modifying, improving or enhancing the olfactory properties of perfume compositions which comprises adding thereto an effective fragrance amount of at least one compound of formula



wherein R represents an alkyl radical containing 1 or from 4-7 carbon atoms.

3,953,378

MINERAL CARRIER FOR VOLATILE SUBSTANCES AND PROCESS FOR PREPARING SAME

Bruno T. Lasser, Givrins, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

Filed Nov. 18, 1974, Ser. No. 525,021

Claims priority, application Switzerland, Nov. 21, 1973, 16439/73; Apr. 5, 1974, 4847/74

Int. Cl.² A61K 7/46

U.S. Cl. 252—522 **12 Claims**

1. A process for preparing a gypsum carrier destined to have incorporated therein a perfume or mixture of perfumes comprising hydrating plaster with an effective amount to cause hydration of a dilute aqueous solution of a glycol selected from polyethylene glycol, polypropylene glycol, polyethylene glycol monoethyl ether, polyethylene glycol lauryl ether, polyethylene glycol nonylphenyl ether and mixtures thereof.

5. A process for preparing a perfumed gypsum article comprising mixing plaster with an effective amount to cause hydration of a dilute aqueous solution of a glycol selected from polyethylene glycol, polypropylene glycol, polyethylene glycol monoethyl ether, polyethylene glycol lauryl ether, polethylene glycol nonylphenyl ether and mixtures thereof and incorporating into the mixture a perfume or mixture of perfumes.

3,953,379

MANUFACTURE OF IMPROVED AQUEOUS ALKALI METAL SILICATE-ALKALI METAL HYDROXYALKYL IMINODIACETATE COMPOSITIONS

Francis R. Cala, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 26, 1973, Ser. No. 410,222

Int. Cl.² C110 3/08

U.S. Cl. 252—527 **16 Claims**

1. A method for the manufacture of composition of aqueous alkali metal silicate-imino salts selected from the group consisting of alkali hydroxy C_2–C_4 alkyl iminodiacetates and propionates which comprise admixing said imino salt at an elevated pH above the normal pH of said salt in water with a solution of the alkali metal silicate and producing therefrom an aqueous composition containing the said imino salt and the alkali metal silicate wherein the gellation and/or precipitation which would normally be obtained from admixing of the said components with the pH of the said imino salt unelevated is prevented or decreased, wherein the ratio to alkali metal oxide, M_2O to SiO_2 in said alkali metal silicate is from 1:1.6 to 1:3.

3,953,380

LIQUID DETERGENT

Bjorn Sundby, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 84,945, Oct. 28, 1970, abandoned. This application Mar. 30, 1973, Ser. No. 346,681

Int. Cl.² C11D 1/72

U.S. Cl. 252—543 **8 Claims**

1. A clear, concentrated liquid detergent composition suitable for laundry use containing no more than 7% by weight of anionic detergent and being free from inorganic and organic builder salts except in sequestering amounts of up to 3% by weight which consists essentially of by weight from 40 to 75% of a nonionic detergent having the formula $RO(C_2H_4O)_nH$, wherein R is a straight chain alkyl of 10 to 18 carbon atoms and n is from 5 to 14, said n being about 0.5 to 1 times the number of carbon atoms in R, (B) 0.5 to 5% of a normally partially water-insoluble fluorescent brightener, (C) 5 to 35% of water, and (D) 5 to 35% of ethanol or isopropanol, with the proportions of (A), (B), (C) and (D) being such that the alkanol-ethylene oxide condensation product solubilizes the fluorescent brightener in the water-alcohol solvent system.

3,953,381

COMPOSITION CONTAINING DIAMIDE AND HALOCARBON FOR TREATMENT OF SURFACES

Jean-Pierre Remond, Massy-Villaine; Jean-Claude Vitat, Antony, and Jean-Robert Thebault, Paris, all of France, assignors to Rhone-Progil, Courbevoie, France

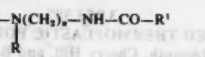
Filed Nov. 7, 1973, Ser. No. 413,607

Claims priority, application France, Nov. 9, 1972, 72.39677; May 8, 1973, 73.16473

Int. Cl.² C11D 3/32, 7/32, 7/30

U.S. Cl. 252—544 **9 Claims**

1. A homogeneous liquid composition, comprising (a) 90 to 99.95% by weight of a solvent of which at least 50% by weight is trichloro-1,1,2-trifluoro-1,2,2-ethane, and (b) 0.05 to 10% by weight of one or more diamides having the formula (I):



in which

R is a saturated or unsaturated aliphatic hydrocarbon group having from 1 to 25 carbon atoms,

R^1 is an aliphatic hydrocarbon group having from 10 to 30 carbon atoms and at least one ethylenic double bond, and

n is a whole number from 1 to 9.

3,953,382
DETERGENT COMPOSITIONS

Roger E. Nelson, Verona, and Allan H. Gilbert, Oradell, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed May 30, 1973, Ser. No. 365,342

Int. Cl.² C11D *1/825*

U.S. Cl. 252—548 **9 Claims**

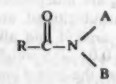
1. A detergent composition comprising a ternary combination of:

i. a water-soluble polyetheneoxy organic nonionic detergent compound of a condensate of ethylene oxide and a primary or secondary alkanol having about 8 to about 16 carbon atoms, the proportion of combined ethylene oxide being from about 52% to about 80% by weight, and mixtures thereof;

ii. a substantially water-insoluble polyalkyleneoxy nonionic compound of a condensate of ethylene oxide and a primary or secondary alkanol having about 8 to about 16 carbon atoms, the proportion of combined ethylene oxide being from about 10% to about 51% by weight, and mixtures thereof; and

iii. an organic compound selected from the group consisting of

a. N-alkanol alkaneamides having the formula



wherein R is an alkyl group having about 8 to about 18 carbon atoms, A is an alkanol group having 1–3 carbon atoms, and B is a member selected from the group of hydrogen and an alkanol group having 1–3 carbon atoms,

b. tertiary amine oxides having the formula $R^1R^2R^3N \rightarrow O$ wherein R^1 is an alkyl group having about 8 to about 18 carbon atoms, and R^2 and R^3 are independently methyl, ethyl, or hydroxyethyl groups, and

c. alkyl sulfoxides having the formula $R^4R^5S \rightarrow O$ wherein

1. R^4 is alkyl having about 10 to about 18 carbon atoms,

2. R^5 is an alkyl radical having 1 to 2 carbon atoms, or a hydroxyethyl radical,

and mixtures thereof;

wherein the proportion of said water-soluble polyetheneoxy organic nonionic detergent compound (i) is about 15% to about 70% by weight of said ternary combination, the proportion of said substantially water-insoluble polyetheneoxy nonionic compound (ii) is about 2% to about 8% by weight, and the proportion of said organic compound (iii) is about 2% to 80% by weight and the weight ratio of (ii) to (iii) is about 15:1 to about 1:15, said percentages being by weight of said ternary combination.

3,953,383
CATALYTIC PROCESS FOR COPOLYMERIZING EPOXY COMPOUNDS WITH CARBON DIOXIDE

Shohei Inoue, Tokyo; Masaki Kanbe, Fujisawa; Tadamichi Takada, Yokohama; Nobuyuki Miyazaki, and Masanori Yokokawa, both of Fujisawa, all of Japan, assignors to Nippon Oil Seal Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 380,222, July 18, 1973, Pat. No. 3,900,424. This application Nov. 12, 1974, Ser. No. 523,160

Claims priority, application Japan, July 21, 1972, 47-73616; July 24, 1972, 47-73443

Int. Cl.² C08G *63/62*

U.S. Cl. 260—2 BP **7 Claims**

1. A process for producing a copolymer of an epoxy compound with carbon dioxide, comprising copolymerizing an epoxy compound with carbon dioxide in the presence of a catalyst composition comprising the reaction product of (a) an organo-metallic compound having the general formula R′nM, wherein *n* is 2 or 3, at least one R′ is selected from the group consisting of an alkyl group, an alicyclic group and halogen, hydroxy and alkoxy derivatives thereof, and hydrogen, the remaining R′ groups are selected from the group consisting of alkyl groups, alicyclic groups, alkaryl groups, aralkyl groups, aryl groups and halogen, hydroxy and alkoxy derivatives thereof, and M is a metal element selected from the group consisting of those metal elements in Groups II and III of the Periodic Table, (b) at least one co-catalyst component selected from the group consisting of sulfur and compounds containing one or more active hydrogen atoms in a molar ratio to the organo-metallic compound within the range of from about 0.1 to about 5.0, and (c) carbon dioxide gas under a pressure at room temperature of from about 5 to about 50 kg/cm² and in a molar ratio to the organo-metallic compound of at least 1, said reaction product having been obtained by reacting together said reactants at a temperature between room temperature and about 300°C for a time of from about 0.1 to about 100 hours, the copolymerization being carried out at a temperature within the range of from about 0°C to about 150°C.

3,953,384
PROCESS FOR PREPARING POLYURETHANE FOAMS

Makoto Funatsu; Shinichiro Yasuda, and Toshimitu Hiraizumi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

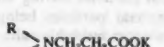
Filed Oct. 25, 1974, Ser. No. 517,933

Claims priority, application Japan, Oct. 30, 1973, 48-122007

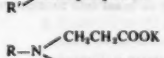
Int. Cl.² C08G *18/18, 18/20*

U.S. Cl. 260—2.5 AC **3 Claims**

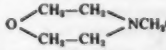
1. In a process for preparing polyurethane foam by reacting a polyol having at least two active hydrogen atoms, with a polyisocyanate, the improvement which comprises carrying out the reaction in the presence of a catalytic amount of a compound selected from the group consisting of compounds having the formulas



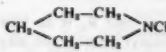
(1)



(2)



(3)



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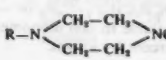
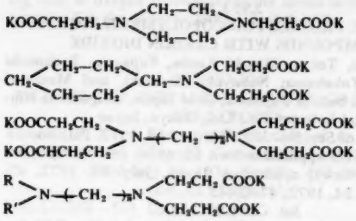


(5)



wherein R and R′ are alkyl having 1 to 18 carbon atoms, an *n* is an integer from 2 to 6, and mixtures thereof, as a catalyst.

3,953,385

NOVEL PRODUCTS AND PROCESS

Robert D. Dworkin, Old Bridge, and Adam J. Ejk, Piscataway, both of N.J., assignors to M&T Chemicals Inc., Greenwich, Conn.

Division of Ser. No. 409,414, Oct. 25, 1973, abandoned. This application Dec. 5, 1974, Ser. No. 529,798

Int. Cl.² C08J *9/06*

U.S. Cl. 260—2.5 P **2 Claims**

1. A composition for preparing rigid cellular vinyl chloride polymers, said composition comprising

a. 100 parts by weight of a vinyl chloride homopolymer or a copolymer of vinyl chloride with a copolymerizible ethylenically unsaturated monomer,

b. between 0.1 and 10 parts of a blowing agent, and

c. between 0.1 and 10 parts of a combined blowing agent activator and heat stabilizer which in turn comprises a diorganotin mercaptide compound of the formula $R_2^1Sn(SR^2)_2$ wherein R^1 and R^2 are hydrocarbyl groups.

3,953,386

AQUEOUS EMULSIONS CONTAINING HOMOGENEOUS PARTICLES OF CELLULOSIC ESTER/ACRYLIC POLYMERS

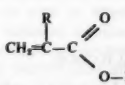
Charles Vincent Murphy, and David William Zunker, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 2, 1974, Ser. No. 485,271

Int. Cl.² C08L *1/18, 1/10*

U.S. Cl. 260—17 A **7 Claims**

1. An aqueous polymer emulsion comprising an aqueous continuous phase and dispersed therein particles having an average diameter of up to 5 microns, said particles being substantially a homogeneous blend of a water insoluble cellulosic ester and a polymer derived from at least one monomer of the formula:



where R is hydrogen or methyl radical, and R_1 is an alkyl radical of 1 to 20 carbon atoms; cycloalkyl wherein the alkyl is 5 or 6 carbon atoms; $-CH_2CH_2OCH_2CH_3$; $-C_6H_5$ or $-CH_2C_6H_5$, said cellulosic ester being soluble in said monomer in the amount of at least about 10 percent by weight.

3,953,387

STABILIZED THERMOPLASTIC POLYURETHANES

Larry G. Wolgemuth, Cherry Hill, and Benjamin C. Wilbur, Williamstown, both of N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Nov. 6, 1974, Ser. No. 521,213

Int. Cl.² C08K *5/13*

U.S. Cl. 260—18 TN **7 Claims**

1. A thermally stabilized organotin-containing polyurethane composition containing as the stabilizer about 0.001 to 5%, based on the weight of polyurethane in the composition, of a mixture containing a carboxylic acid component consisting of at least one carboxylic acid selected from the group consisting of lauric acid, palmitic acid, and stearic acid; and a sterically hindered phenol component containing at least one tertiary alkyl group in a position ortho to the ring hydroxyl group, the ratio of total carboxylic acid to sterically hindered phenol compound varying from about 1:19 to 19:1.

3,953,388

THERMALLY STABLE POLYCARBONATE

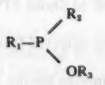
Frank Nunzio Liberti, Mount Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 320,255, Jan. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 103,824, Jan. 4, 1971, Pat. No. 3,729,440. This application Jan. 8, 1975, Ser. No. 539,293

Int. Cl.² C08J *3/20*

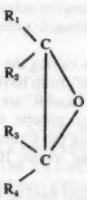
U.S. Cl. 260—18 EP **4 Claims**

1. A thermally stable aromatic polycarbonate composition stabilized with (a) 0.005 to 1.0 weight percent of a phosphinite of the following formula:



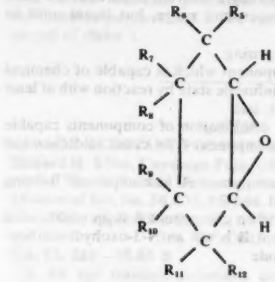
wherein R_1, R_2, and R_3 are independently selected from the group consisting of unsubstituted and halogen-substituted alkyl, aryl, cycloalkyl, aralkyl and alkaryl radicals of 1–25 carbon atoms, and (b) 0.01 –0.5 weight percent of an epoxy compound selected from the group consisting of:

I. Derivatives of epoxy ethane represented by the following formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen, an alkyl radical or 1–24 carbon atoms, an aryl radical of 6–24 carbon atoms, $-CH_2OR'$, $-CH_2OCOR'$, $-CH_2OCOR''COOCH_2X$, $CH_2OR''OCH_2X$ wherein R′ is selected from the group consisting of an alkyl radical of 1–24 carbon atoms or an aryl radical of 6 to 24 carbon atoms and wherein R″ is an alkylene radical of 1–24 carbon atoms and X is an oxirane ring.

II. Derivatives of epoxy cyclohexane represented by the following formula:



wherein R_5 through R_{12} are independently selected from the group consisting of hydrogen, alkyl radicals of 1–24 carbon atoms, $-COOR_{13}$, $-OCOR_{13}$, $-COOR_{14}X$, $-OCOR_{14}-COOX$ wherein R_{13} is an alkyl radical of 1–24 carbon atoms and R_{14} therein is an alkylene radical of 1–24 carbon atoms and X is an oxirane ring.

3,953,389

PREPARATION OF POWDERED RUBBERS

Gilbert John Holliday, Shrewsbury, and John Norris, Clanfield, near Portsmouth, both of England, assignors to BP Chemicals International Limited, London and G. J. Holliday (Plastics) Limited, both of, England

Continuation of Ser. No. 435,738, Jan. 23, 1974, abandoned. This application May 28, 1975, Ser. No. 581,494

Int. Cl.² C08C *3/00, 4/00;* **C08K** *11/00, 11/72*

U.S. Cl. 260—23.7 M **9 Claims**

1. A process for the preparation of a free-flowing powdered rubber which comprises reducing a rubber to a fine powder by air attrition in which coarse ground rubbery material is conveyed through a comminution zone by a current of air, adding an aqueous dispersion of an anti-tack agent to the fine powdered rubbery material and suspending the rubbery material in a powdered form in a stream of a gas, removing at least part of the water, and subsequently treating the powdered rubbery material with a dusting powder.

3,953,390

PROCESS FOR PREPARING A COMPOSITION FOR THE SURFACE OF ROADS, AIRPORT RUNWAYS AND LIKE SURFACES AND THE PRODUCTS OBTAINED

Marcel Ceintrey, Marly-le-Roi, France, assignor to Societe Chimique, Routiere et d'Entreprise Generale (S.C.R.E.G.), Paris, France

Filed May 6, 1974, Ser. No. 467,568

Claims priority, application France, May 10, 1973, 73.16935

Int. Cl.² C08L *91/00*

U.S. Cl. 260—28.5 AS **5 Claims**

1. In a process for preparing a composition for the surface of roads, airport runways, canals, dams and like surfaces, by mixing in a mixer mineral granulates with 4 to 12% by weight, with respect to the weight of the granulates, of a binder consisting essentially of 93 to 96% by weight of a first component selected from fluxed coal pitch and fluxed coal tar and 4 to 7% by weight of a second component selected from a polymer of vinyl chloride and a copolymer of vinyl chloride, the improvement consisting of (*a*) mixing first in 5–20 sec. said second component in the form of a powder having a particle size of less than 100 microns with the granulates previously heated to a temperature between 120° and 160°C, (*b*) thereafter introducing said first component in the mixer in contact with the mixture thus obtained, and (*c*) further mixing the composition, the total mixing time of steps (*a*) and (*c*) being of from 40 sec. to 90 sec.

3,953,391

CATIONIC ACRYLIC ELECTRODEPOSITABLE COMPOSITIONS

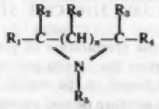
Rostyslaw Dowbenko, and Wen-Hsuan Chang, both of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 47,860, June 19, 1976, Pat. No. 3,679,564. This application Mar. 9, 1972, Ser. No. 233,319

Int. Cl.² C08L *33/14*

U.S. Cl. 260—29.6 TA **5 Claims**

1. An aqueous electrodeposition bath comprising an aqueous dispersion of a coating composition comprising an acid solubilized interpolymer prepared by reacting at least a portion of the carboxyl groups of an interpolymer, prepared from an ethylenically-unsaturated carboxylic acid and at least one other ethylenically-unsaturated monomer, with an imine of the formula:



where R_1, R_2, R_3, R_4 and R_5 are each hydrogen, alkyl, aryl, alkaryl or aralkyl, R_6 is hydrogen or a lower alkyl radical, usually not having more than 6 carbon atoms, and n is 0 or 1.

3,953,392

STYRENE RESIN COMPOSITION

Masaru Higuchi; Hajime Ohnishi, and Hiroshi Yagihara, all of Seitama, Japan, assignors to Daicel Ltd., Osaka, Japan

Division of Ser. No. 376,318, July 5, 1973, Pat. No. 3,883,464, and a continuation-in-part of Ser. No. 212,787, Dec. 27, 1971, Pat. No. 3,817,900. This application Jan. 27, 1975, Ser. No. 544,055

Claims priority, application Japan, Dec. 30, 1970, 45-122245; Nov. 17, 1971, 46-92284

The portion of the term of this patent subsequent to May 13, 1992, has been disclaimed.

Int. Cl.² C08K *5/13, 5/15*

U.S. Cl. 260—30.4 A **8 Claims**

1. A thermoplastic synthetic resin moldable composition, consisting essentially of

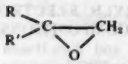
A. a synthetic resin consisting of (1) 3 to 50 percent by weight of rubber component,

and the balance of said resin is (2) a copolymer grafted onto said rubber component, said copolymer consisting of

a. from 50 to 90 percent by weight, based on said copolymer; of at least one first monomer component selected from the group consisting of styrene, α-methyl styrene and nucleus substituted styrenes, and the balance of said copolymer is

b. at least one second monomer component selected from the group consisting of acrylonitrile and the methyl, ethyl and butyl esters of acrylic acid and methacrylic acid, said resin having blended therein,

B. from 0.01 to 3.0 percent by weight, based on the weight of said resin, of one or a mixture of lubricants of the formula



wherein R and R′ each represent hydrogen or straight chain alkyl and the sum of the carbon atoms in R and R′ is 14 to 42.

3,953,393

LOW TEMPERATURE PROCESS FOR THE PREPARATION OF GRAFT COPOLYMER DISPERSIONS

Gerhard G. Ramlow, Ludwigshafen, Germany; Louis C. Pizzini, Trenton, and John T. Patton, Jr., Wyandotte, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 7, 1974, Ser. No. 431,081
Int. Cl.² C08K *5/06, 5/10;* **C08L** *51/08, 67/06*
U.S. Cl. 260—31.8 R **8 Claims**

1. In a process for the preparation of graft copolymer dispersions which comprises the in situ polymerization of from 1% to 30% by weight based on the weight of polyol mixture of a vinyl monomer or mixture of said monomers in a co-reactive unsaturation-containing polyol mixture containing from 0.1 mole to 3.0 moles of unsaturation per mole of polyol mixture in the presence of from 0.05% to 5% by weight based on the weight of said vinyl monomer of a free radical catalyst, the improvement which comprises carrying out the polymerization at a temperature below 100°C. and in the presence of from 0.1% to 2% by weight based on the weight of vinyl monomer of an alkyl mercaptan chain transferring agent.

3,953,394

POLYESTER ALLOYS AND MOLDING COMPOSITIONS CONTAINING THE SAME

Daniel W. Fox, and Allen D. Wambach, both of Pittsfield, Mass., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 15, 1971, Ser. No. 199,037
Int. Cl.² C08L *67/02*
U.S. Cl. 260—40 R **40 Claims**

1. A thermoplastic, stable blended composition that is rigid at a temperature of 75°–90°F comprising

a. from about 1 to about 99 parts by weight of a poly-(ethylene terephthalate) resin and

b. from about 99 to about 1 part by weight of a poly(1,4-butylene terephthalate) resin or a copolyester thereof with a minor amount of an aliphatic or aromatic dicarboxylic acid or an aliphatic polyol.

3,953,395

NOVEL COMPOSITIONS SUITABLE FOR MOLDING

Eugene Richard Farone, Mentor, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 423,337, Dec. 10, 1973, abandoned. This application Aug. 28, 1974, Ser. No. 501,126
Int. Cl.² C08L *67/06*
U.S. Cl. 260—40 R **30 Claims**

1. A composition of matter which has a Brookfield viscosity at 93°C. lower than about 10,000 cp. and which is

substantially non-volatile;

solid and substantially storage stable within a lower temperature range which includes ambient and normal storage temperatures;

liquid, homogeneous, substantially non-reactive and capable of wetting or saturating a filler or reinforcing medium and thereafter remaining liquid within an intermediate temperature range which includes temperatures between about 50° and 150°C.;

readily and reversibly convertible from the solid to the liquid state by varying the temperature between said lower and intermediate ranges;

capable of being chemically converted to an infusible state within a higher temperature range, but liquid until so converted;

said composition comprising

A. at least one component which is capable of chemical conversion to an infusible state by reaction with at least one other reagent; and

B. a component or combination of components capable of reaction with component A to cause said chemical conversion;

the weight ratio of component A to component B being between about 0.8:1 and 2:1;

with the proviso that when component A is an unsaturated polyester, component B is not an N-3-oxohydrocarbon-substituted acrylamide

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3,953,396

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,128
Int. Cl.² C08K *5/42;* **C08L** *69/00*
U.S. Cl. 260—45.8 A **8 Claims**

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of a metal salt of substituted and unsubstituted sulfonic acids of monomeric aromatic ethers, and mixtures thereof, wherein said metal salts thereof are selected from the group consisting of alkali metals and alkali earth metals, and mixtures of these metal salts, and said substituent on the metal salt of the substituted sulfonic acids of aromatic ethers is selected from the group consisting of electron withdrawing radicals and mixtures of electron withdrawing radicals.

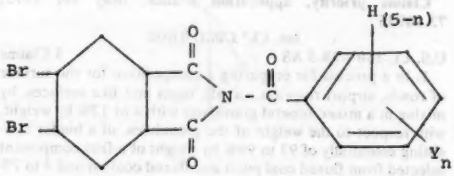
3,953,397

N-(HALOBENZOYL)-3,4-DIBROMOHEXAHYDROPHTHALIMIDES

Sidney B. Richter, Chicago, and Glendon D. Kyker, Glen Ellyn, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 14, 1975, Ser. No. 567,467
Int. Cl.² C07D *209/48;* **C08R** *3/20, 5/34*
U.S. Cl. 260—45.75 B **11 Claims**

1. A compound of the formula



wherein Y is chlorine or bromine and n is an integer from 2 to 5.

6. A fire retardant polymeric composition comprising a combustible polymer and a fire retarding amount of a compound of claim 1.

3,953,398

AGE RESISTANT POLYMERIC COMPOSITIONS

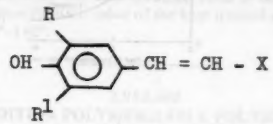
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 56,635, July 20, 1970, Pat. No. 3,714,122. This application Oct. 26, 1972, Ser. No. 300,959

Int. Cl.² C08J 3/20

U.S. Cl. 260—45.85 B 5 Claims

1. An age resistant polymeric composition comprising a polymer susceptible to oxygen degradation having incorporated therin a stabilizing amount of at least one phenolic compound having the following structural formula:



wherein R and R¹ are tertiary alkyl groups having 4 to 8 carbon atoms and wherein X is

wherein R³ is selected from the group consisting of hydrogen and alkyl groups having from 1 to 4carbon atoms.

3,953,399

FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Dec. 28, 1973, Ser. No. 429,127

Int. Cl.² C08K 5/42; C08L 69/00

U.S. Cl. 260—45.85 H 6 Claims

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of a metal salt of monomeric substituted and unsubstituted sulfonic acids of aromatic carboxylic acids and esters, and mixtures thereof, wherein said metal salts thereof are selected from the group consisting of alkali metals and alkali earth metals, and mixtures of these salts and said substituent on the metal salt of the substituted sulfonic acids of aromatic carboxylic acids and esters is selected from the group consisting of an electron withdrawing radical and mixtures of electron withdrawing radicals.

3,953,400

POLYKETONES AND METHODS THEREFOR

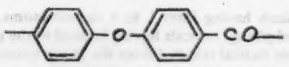
Klaus J. Dahl, Palo Alto, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 218,465, Jan. 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 115,824, Feb. 16, 1971, abandoned. This application Mar. 15, 1974, Ser. No. 451,521

Int. Cl.² C08G 65/38, 65/40

U.S. Cl. 260—47 R 27 Claims

1. A crystalline melt-processable polymer consisting essentially of repeating units of formula



having a mean inherent viscosity within the range from about 0.8 to about 1.65 and elongation of at least about 50%.

3,953,401

PROCESS FOR SEPARATING AROMATIC POLYMERS FROM SOLUTION

Rudolf Gabler, Vitikon, and Josef Studinka, Zurich, both of Switzerland, assignors to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Jan. 22, 1974, Ser. No. 435,555

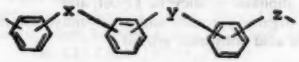
Claims priority, application Switzerland, Jan. 26, 1973, 1114/73

Int. Cl.² C08G 65/40, 69/46, 75/24

U.S. Cl. 260—49 8 Claims

1. A process for isolating a high molecular weight aromatic polymer in the form of a fine, uniform powder, said polymer being easily freed of residual salts and solvent, which comprises

a. dissolving in an aprotic solvent a polymer having the repeating structure (I):



(I)

in which the linking bonds on any particular benzene ring are positioned meta or para to each other, in which x, y and z, each being the same or different, consist of the radicals —O—, —S—, $-SO_2-$ —CO—, —CONH—, —N=N—, $-C(CH_3)_2-$, $-(CH_2)_n-$ where n is 1 or 2, or a direct bond between the benzene rings; and

b. spraying the polymer solution onto the surface of a moving precipitation medium having the formula ROH in which R is a hydrogen or an alkyl group having 1 to 4 carbon atoms, thereby precipitating said polymer in a fine, uniform powder.

3,953,402

AGE RESISTANT POLYMERS OF DITERTIARY ALKYL-4-HYDROXYARYL ACRYLATE AND DIENES

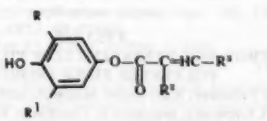
Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 20, 1970, Ser. No. 56,633

Int. Cl.² C08D 1/24, 1/09, 3/06; C08F 15/02

U.S. Cl. 260—62 24 Claims

1. A process of preparing an age resistant polymeric composition comprising polymerizing in an emulsion free radical polymerization system, a monomer system containing at least one phenolic monomer having the following structural formula:



wherein R and R¹ are tertiary alkyl radicals having from 4 to 8 carbon atoms, R² is selected from the group consisting of hydrogen; alkyl radicals having from 1 to 4 carbon atoms, carboxymethyl radical and carbalkoxymethyl radicals and wherein R³ is selected from the group consisting of hydrogen;

alkyl radicals having from 1 to 4 carbon atoms, phenyl and substituted phenyl radicals having located in the para position at least one radical selected from the group consisting of alkyl radicals having 1 to 4 carbon atoms and alkoxy radicals having 1 to 2 carbon atoms, carboxyl radical and carbalkoxy radicals, and wherein the monomer system contains at least 40 parts by weight of diene monomer per 100 parts by weight of total monomer in the monomer system.

3,953,403

POWDER COATING COMPOSITION

Kanji Fujiyoshi; Yutaka Mizumura, and Junji Sono, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed June 25, 1973, Ser. No. 373,218

Claims priority, application Japan, June 28, 1972, 47-65317; June 29, 1972, 47-65687

Int. Cl.² C08G *63/12*

U.S. Cl. 260—75 T **6 Claims**

1. A powdered composition comprising

1 a terephthalic acid-based unsaturated polyester which is prepared by reacting

a terephthalic acid or its lower alkyl ester,

b an α-olefinic dicarboxylic acid or its anhydride,

c an organic acid having at least three carboxyl groups in the molecule or its anhydride, and

d an aliphatic or alicyclic glycol; and

2 an organic peroxide and a polyanhydride having at least two acid anhydride groups.

3,953,404

SOLID STATE POLYMERIZATION OF POLY(1,4-BUTYLENE TEREPHTHALATE)

Willem F. H. Borman, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Feb. 7, 1974, Ser. No. 440,443

Int. Cl.² C08G *63/26*

U.S. Cl. 260—75 M **11 Claims**

1. A method for the solid-state polymerization of a high melt viscosity branched copolyester of poly(1,4-butylene terephthalate) that includes from 0.01 to 3 mole percent, based on the terephthalate units, of units of a branching component which contains at least three ester-forming groups, said polyester having an intrinsic viscosity of greater than about 1.05 deciliters per gram, measured as a solution in a 60:40 mixture of phenol and tetrachloroethane at 30°C., said process comprising:

a. transforming a corresponding polyester having an intrinsic viscosity of from about 0.1 to about 1.0 deciliters per gram as measures as a solution in a 60:40 mixture of phenol and tetrachloroethane at 30°C. into pellets; and

b. heating the particles of solid polyester at a temperature of about 150°C. and below the melting point of said polyester in the presence of a mixture of an inert gas and a minor amount of 1,4-butanediol, which is formed by passing said inert gas through a heated zone containing said 1,4-butanediol, until the desired degree of increase in intrinsic viscosity is obtained.

3,953,405

METHOD FOR PREPARING LOW PILLING EFFECT POLYESTER FIBER PRODUCTS

Roland Feinauer; Karl-Heinz Magosch, and Jorn Ruter, all of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft

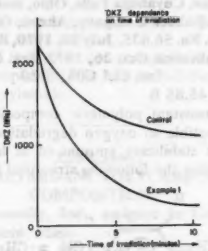
Filed Aug. 5, 1974, Ser. No. 495,074

Claims priority, application Germany, Sept. 11, 1973, 2345653

Int. Cl.² C08G *63/12*

U.S. Cl. 260—75 T **14 Claims**

1. An improvement in the process of melt spinning ethylene terephthalate polyester to produce textile fibers having substantially decreased pilling in fabrics containing the fibers comprising melt polymerizing ethylene terephthalate in the presence of a condensation catalyst to a final temperature of about 250°C to 300°C and a final pressure of less than 10 mm of mercury to form an anhydrous melt, the improvement comprising:



conducting said melt polymerizing in the presence of about 0.05 to 5.0 mole percent, with respect to the acid component, of a substituted cyclobutanedicarboxylic acid;

melt spinning said anhydrous melt; and

exposing said melt spun fibers to irradiation with high energy light.

3,953,406

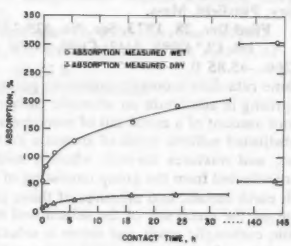
WATER-INSOLUBLE, SWELLABLE POLYURETHANES

Harold E. Marsh, Jr., La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Jan. 26, 1973, Ser. No. 326,768

Int. Cl.² C08G *18/48*; A61K *31/785*

U.S. Cl. 260—77.5 AM **11 Claims**



1. A lightly cross-linked, water-insoluble, swellable, polyurethane, network polymer comprising a cross-linked network of polymer segments consisting essentially of from 1 to 90% by weight of hydroxyl-terminated hydrophilic polyether chain segments, the remainder being hydroxyl-terminated oleophilic hydrocarbon polymer chain segments, a trihydroxy, organic cross-linking agent in an amount less than one cross-link for every 4,000 chain atoms of the network polymer and a substantially stoichiometric amount of diisocyanate curing agent, said segments containing no less than 25 backbone chain atoms and said polymer being in the form of particles having a diameter of no more than 1 mm, a swellability of no less than 2, an absorptivity on a dry basis of polar organic compounds of at least 10 percent, and a cross-link density of no more than one cross-link for every 4,000 backbone chain atoms.

3,953,407

PROCESS FOR PREPARING PAPER SIZE RESIN

Hideo Hayashi; Hisatake Sato, and Shiro Saito, all of Yokohama, Japan, assignors to Nippon Oil Co., Ltd., Tokyo, Japan

Filed July 9, 1974, Ser. No. 486,746
Claims priority, application Japan, July 16, 1973, 48-79297
Int. Cl.² C08F 8/46, 240/00
U.S. Cl. 526—22 9 Claims

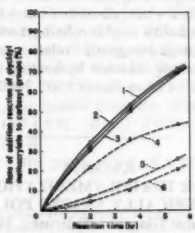
1. A process for preparing a resin suitable for preparation of sizes, which comprises polymerizing a cracked oil fraction which is obtained by the thermal cracking of petroleums, has a boiling point of 20° to 220°C., and contains diolefins, thereby to form a hydrocarbon resin, reacting the resulting hydrocarbon resin with 0.08 to 0.3 mol of 100 unsaturated dicarboxylic acid or its anhydride per 100g of the hydrocarbon resin, and heating the acid-modified resin in the presence of water or the alkali metal hydroxide at a temperature of 130° to 350°C whereby the acid-modified resin is decarboxylated until the saponification value of the heat treated acid-modified resin is 60°–140°.

3,953,408

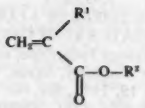
ADDITION POLYMERIZABLE POLYMERIC COMPOUNDS

Keizo Hosoi, Tokyo; Hiroshi Sagami, Shiki, and Isao Imai, Niiza, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 208,690, Dec. 16, 1971, Pat. No. 3,796,578. This application Oct. 18, 1973, Ser. No. 407,704
Claims priority, application Japan, Dec. 26, 1970, 45-128473; Mar. 6, 1971, 46-11702; Mar. 6, 1971, 46-11703; Mar. 17, 1971, 46-14385
Int. Cl.² C08F 212/08, 220/06
U.S. Cl. 260—836 8 Claims



1. In addition polymerizable polymeric compound obtained by esterification reaction of a copolymer having pendent carboxyl groups with about 0.10 to 0.8 equivalent, based upon the carboxyl groups of said copolymer, of an ethylenically unsaturated compound having one oxirane ring, said copolymer being obtained by copolymerizing (1) about 10 to 95 percent by weight of at least one member selected from the group consisting of styrene and the methyl-substituted styrene derivatives, (2) about 5 to 70 percent by weight of at least one ethylenically unsaturated compound selected from the group consisting of a monocarboxylic acid, a dicarboxylic acid, a dicarboxylic acid anhydride and a monoalkyl ester of a dicarboxylic acid wherein the alkyl group contains from 1 to 4 carbon atoms, (3) up to about 30 percent weight of at least one member selected from the group consisting of acrylonitrile and methacrylonitrile, (4) up to about 85 percent by weight of at least one compound of the formula



wherein R^1 represents a hydrogen atom or methyl group; and R^2 represents an alkyl group having 1 to 12 carbon atoms, and (5) up to about 50 percent by weight, based upon the total weight of said compound (3) and/or (4), of at least one vinyl ester of a saturated aliphatic nono-carboxylic acid having 2 to 10 carbon atoms.

3,953,409

PROCESS FOR PRODUCING CONJUGATED DIOLEFINIC POLYMERS

Koei Komatsu; Shigeyuki Nishiyama, both of Yokohama; Nobuyuki Sakabe, Kawasaki, and Akira Kogure, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed May 21, 1970, Ser. No. 39,569
Claims priority, application Japan, May 31, 1969, 44-41718; June 30, 1969, 44-50954; Aug. 25, 1969, 44-66464
Int. Cl.² C08F 236/16, 236/18
U.S. Cl. 526—82 19 Claims

1. A process for producing a conjugated diolefinic polymer by polymerizing at least one conjugated diolefin monomer or copolymerizing at least one conjugated diolefin monomer with at least one vinyl aromatic hydrocarbon monomer in a hydrocarbon or halogenated hydrocarbon solvent in the presence of an alfin catalyst and a molecular weight regulator, the molecular weight regulator being a polyhalogenated unsaturated hydrocarbon selected from the group consisting of vinylidene chloride, vinylidene bromide, vinylidene iodide, vinylidene fluoride, 1,2-dichloroethylene, 1,2-dibromoethylene, 1,2-diiodoethylene, trichloroethylene, tribromoethylene, triiodoethylene, tetrachloroethylene, tetrabromoethylene, tetraiodoethylene, tetrafluoroethylene, 1-chloro-2-fluoroethylene, 1-chloro-2-bromoethylene, 1-chloro-1-fluoroethylene, 1,1-dichloro-1-propene, 1,1-dibromo-1-propene, 1,1-dichloro-1-butene and 1,1-dichloro-1-pentene.

3,953,410

PROCESS FOR PRODUCING AMORPHOUS OLEFIN INTERPOLYMER

Daizaburo Imai, and Keisaku Yamamoto, both of Ichihara, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 12, 1974, Ser. No. 460,549
Claims priority, application Japan, Apr. 16, 1973, 48-43478; Apr. 16, 1973, 48-43480
Int. Cl.² C08F 210/00, 212/00
U.S. Cl. 526—284 31 Claims

1. A process for producing a substantially amorphous rubbery interpolymer, which comprises interpolymerizing ethylene, an α-olefin, and a nonconjugated diolefin having a norbornene ring by use of a catalyst comprising a combination of (1) an alkylaluminum sesquichalide represented by the general formula $AlR_{3-n}X_n$ (where R is an alkyl group having 1 to 8 carbon atoms, X is a halogen atom, and n is a number larger than 1 but smaller than 2), (2) an ester compound having an aromatic group or/and an olefinically unsaturated group, and (3) at least one compound selected from transition metal compounds.

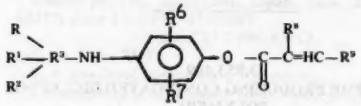
3,953,411

AGE RESISTANT POLYMERS OF 4-(ARYLAMINO)ARYL ESTERS OF α,β UNSATURATED CARBOXYLIC ACIDS

Richard H. Kline, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 15, 1971, Ser. No. 153,449
Int. Cl.² C08F 1/13, 15/02; C08D 3/04, 3/06
U.S. Cl. 526—312 26 Claims

1. A process of preparing an age resistant polymeric composition comprising polymerizing in an emulsion free radical polymerization system, a monomer system containing at least one monomeric age resister having the following structural formula:



(I)

wherein R^3 is an aryl radical, R and R^1 are selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms and alkoxy radicals having from 1 to 4 carbon atoms, R^2 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, alkoxy radicals having from 1 to 4 carbon atoms and a radical having the following structural formula:

wherein R^4 is selected from the group consisting of alkyl radicals having from 1 to 12 carbon atoms, cycloalkyl radicals having from 5 to 12 carbon atoms, aryl radicals having from 6 to 12 carbon atoms and aralkyl radicals having from 7 to 13 carbon atoms, R^5 is selected from the group consisting of hydrogen and alkyl radicals having from 1 to 12 carbon atoms and wherein R^6 and R^7 are selected from the group consisting of hydrogen and alkyl radicals having from 1 to 4 carbon atoms, wherein R^8 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, carboxymethyl radical and carbalkoxymethyl radicals and R^9 is selected from the group consisting of hydrogen, alkyl radicals having from 1 to 4 carbon atoms, phenyl and substituted phenyl, carboxyl radical and carbalkoxy radicals and wherein the monomer system contains at least 40 parts by weight of diene monomer per 100 parts by weight of total monomer in the monomer system.

3,953,412

SINTERED MICRO-POWDER OF TETRAFLUOROETHYLENE POLYMERS

Takumi Saito, No. 2016 Komagoe, and Shigeki Hayashi, No. 5-34 Mukaida-cho, both of, Shimizu, Shizuoka, Japan

Division of Ser. No. 384,504, Aug. 1, 1973. This application Nov. 20, 1974, Ser. No. 525,669
Claims priority, application Japan, Aug. 9, 1972, 47-79104
Int. Cl.² C08F 6/14, 6/24
U.S. Cl. 526—247 22 Claims

1. Sintered micro-powder of tetrafluoroethylene polymer wherein the polymer is the homopolymer of tetrafluoroethylene, made by emulsion polymerization of tetrafluoroethylene, a non-melt fabricable copolymer of tetrafluoroethylene with a copolymerizable ethylenically unsaturated monomer or a melt-fabricable copolymer of tetrafluoroethylene and hexafluoropropylene or a perfluorovinyl ether, said sintered micropowder characterized in that the average particle size is between 1.9μ and 100μ, sphere factor is less than 1.2, specific gravity is less than 2.20, and weight loss on heating is less than 0.5%.

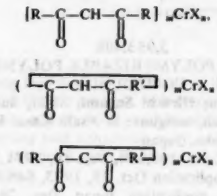
3,953,413

SUPPORTED CHROMIUM-CONTAINING CATALYST AND PROCESS OF POLYMERIZING 1-OLEFINS

Yu-Tang Hwang, and Howard L. Grimmett, both of Clinton, Iowa, assignors to Chemplex Company, Rolling Meadows, Ill.

Filed June 13, 1974, Ser. No. 478,879
Int. Cl.² C08F 4/02, 10/02
U.S. Cl. 526—350 36 Claims

1. A catalyst prepared by dispersing on a finely divided, difficultly reducible, inorganic support of the class consisting of silica, alumina, thoria, zirconia, titania, magnesia and mixtures and composites thereof a chromium chelate of a beta-dicarbonyl compound essentially of the formula of the class consisting of



wherein each R is individually selected from hydrogen, alkyl, alkenyl, aryl, cycloalkyl and cycloalkenyl radicals and combinations of these radicals with each R containing 0–20 carbon atoms and a corresponding valence-satisfying number of hydrogen atoms, R′ is selected from alkylene, alkenylene, arylene, cycloalkylene and cycloalkenylene radicals and combinations of these bivalent radicals with R′ containing 1–20 carbon atoms and a corresponding valence-satisfying number of hydrogen atoms, m is a whole number from 1 to 3, n is a whole number from 0 to 2 with m plus n being a whole number of 2 to 3 and X is a negative group, relative to chromium and activating the resulting mixture by heating to and at an elevated temperature of from about 850°–2000°F. in a non-oxidizing atmosphere.

3,953,414

CATALYSTS FOR THE POLYMERIZATION OF OLEFINS TO SPHERICALLY SHAPED POLYMERS

Paolo Galli, Ferrara; Giovanni Di Drusco, Milan, and Saverio De Bartolo, Ferrara, all of Italy, assignors to Montecatini Edison S.p.A.,, Milan, Italy

Continuation of Ser. No. 396,538, Sept. 12, 1974, abandoned. This application Nov. 15, 1974, Ser. No. 524,258
Claims priority, application Italy, Sept. 13, 1972, 29126/72
Int. Cl.² C08F 210/00, 212/00
U.S. Cl. 526—348 13 Claims

1. Catalysts for the polymerization of olefins obtained by mixing:

a. a catalyst-forming component which is an organometallic compound of metals of Group II and III of the Mendelyeev Periodic System, with

b. a supported catalyst-forming component which is the product consisting of a carrier comprising an anhydrous Mg dihalide and of a halogenated Ti-compound chemically fixed on the carrier or dispersed on the same, said product being in the form of spherically shaped particles of a diameter comprised between 1 and 350 micron, which are characterized by values of the resistance to crumbling under the action of supersonic vibrations expressed in Watt.h/l, of the mean radius of the pores and

of the surface area, which satisfy one of the following relationships:

1. resistance to supersonic vibrations comprised between 5 and 40 Watt.h/l, mean radius comprised between 30 and 70 A and surface area comprised between 3 and 70 sq.mt/g;
2. resistance to supersonic vibrations of 1–20 Watt.h/l, mean radius of the pores comprised between 70 and 150 A and surface area greater than 70 sq.mt/g.

13. Polyolefins in the form of spherically shaped non-extruded particles having a diameter comprised between 0.5 and 3 mm. containing a Ti compound in a quantity, expressed as metal Ti, of less than 30 ppm, and further characterized in that said particles do not crumble when subjected to 240 oscillations per minute for 20 minutes in a metal cylinder containing porcelain balls having a diameter of 25 mm and fitted with a metal plug fixed horizontally on a sledge having a travel of 50 mm and do not compact when subjected to the same conditions after compression thereof under a pressure of 394 kg 1 sq. cm.

3,953,415

PROCESS FOR THE PREPARATION OF BIOLOGICALLY ACTIVE POLYPEPTIDES CONTAINING ASPARTYL GROUP

Lajos Kisfaludy; Miklos Low; Istvan Schon; Tamas Szirtes; Maria Sz. Sarkozi; Sandor Bajusz; Andrae Turan; Rosa Beks; Attila Juhasz; Laszlo Graf; Kalman Medzihradszky, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt, Budapest, Hungary

Filed May 14, 1973, Ser. No. 360,198

Claims priority, application Hungary, May 15, 1972, 7776

Int. Cl.² C07C *103/52*; C07G *7/00*

U.S. Cl. 260—112.5 R 1 Claim

1. A process for the preparation of a peptide having the formula (I)

Ser-Tyr-Ser-Met-Glu-His-Phe-Arg-Trp-Gly-Lys-Pro-Val-Gly-Lys-Lys-Arg-Arg-Pro-Val-Lys-Val-Tyr-Pro-Asn-Gly-Ala-Glu-Asp-Glu-Q

wherein Q is selected from the group which consists of:

a. Ser-OH,
b. Ser-Ala-OH,
c. Ser-Ala-Glu-OH,
d. Ser-Ala-Glu-Ala-OH,
e. Ser-Ala-Glu-Ala-Phe-OH,
f. Ser-Ala-Glu-Ala-Phe-Pro-OH,
g. Ser-Ala-Glu-Ala-Phe-Pro-Leu-OH,
h. Ser-Ala-Glu-Ala-Phe-Pro-Leu-Glu-OH, or
i. Ser-Ala-Glu-Ala-Phe-Pro-Leu-Glu-Phe-OH,

which comprises the step of:

A. reacting a first peptide of the formula

BOC-Ser-Tyr-Ser-Met-Glu(OtBu)-His-Phe-Arg-Trp-Gly-Lys(BOC)-Pro-Val-Gly-OH

with a second polypeptide of the formula

Lys(BOC)-Lys(BOC)-Arg-Arg-Pro-Val-Lys(BOC)-Val-Tyr(tBu)-Pro-Asn-Gly-Ala-Glu(OtBu)-Asp(OtBu)-Glu(OtBu)-Q

in equimolar amount with the first polypetide and in the presence of excess pentafluorophenol and dicyclohexyl carbodimide at a temperature of about 0°C.

3,953,416

SYNTHETIC DECAPEPTIDE HAVING THE ACTIVITY OF THE LUTEINIZING HORMONE RELEASING HORMONE AND METHOD FOR MANUFACTURING THE SAME

Karl Folkers, 6406 Mesa Drive, Austin, Tex.; Bruce L. Currie, 8304 Kromer, Austin, Tex. 78758; Jaw-Kang Chang, 151 Calderon Ave., Mountain View, Calif. 94041; Hans Sievertsson, Lomvagen 77, 191 56 Sollentuna, and Conny Bogentoft, Satunavagen 19 A, 19500 Marsta, both of Sweden

Continuation-in-part of Ser. No. 210,122, Dec. 20, 1971, abandoned, which is a continuation of Ser. No. 158,996, July 1, 1971, abandoned. This application Jan. 14, 1974, Ser. No. 432,903

Int. Cl.² C07C *103/52*; C07G *7/00*

U.S. Cl. 260—112.5 LH 4 Claims

1. A method for prepared the decapeptide, L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-glycyl-L-leucyl-L-arginyl-L-prolyl-glycinamide, by coupling by the DCI method the hexapeptide, L-pyroglutamyl-L-histidyl-L-tryptophanyl-L-seryl-L-tyrosyl-glycine; produced by saponification of the hexapeptide ethyl ester, said hexapeptide ethyl ester produced by coupling the tripeptide, L-pyroglutamyl-L-histidyl-L-tryptophan, produced by coupling L-pyroglutamyl-L-histidine with L-tryptophan benzyl ester by the DCI method and then hydrogenolysis of the benzyl ester, with the tripeptide ethyl ester, L-seryl-L-tyrosyl-glycine ethyl ester by the DCI method, said tripeptide ethyl ester produced by conversion of N-carbobenzyloxy-L-seryl-L-tyrosine hydrazide to the corresponding azide which is added to glycine ethyl ester to give N-carbobenzyloxy-L-seryl-L-tyrosyl-glycine ethyl ester and then hydrogenolysis; with the tetrapeptide, L-leucyl-L-arginyl-L-prolyl-glycinamide, produced by treatment of the blocked tetrapeptide, N-carbobenzyloxy-L-leucyl-N^{G}-para-toluenesulfonyl-L-arginyl-L-prolyl-glycinamide, with hydrogen fluoride; said blocked tetrapeptide produced by coupling N-hydroxysuccinimido-N -carbobenzyloxy-L-leucinate with the tripeptide, N^{G}-para-toluenesulfonyl-L-arginyl-L-prolyl-glycinamide, said tripeptide produced by cleavage of the tert-butyloxycarbonyl group from the blocked tripeptide, N -tert-butyloxycarbonyl-N^{G}-para-toluensulfonyl-L-arginyl-L-prolylglycinamide, said blocked tripeptide produced by coupling N -tert-butyloxycarbonyl-N^{G}-para-toluenesulfonyl-L-arginine with L-prolyl-glycinamide by the DCI method.

3,953,417

SYNTHETICALLY MODIFIED TRYPSIN INHIBITORS AND PROCESS FOR PREPARING THEM

Wolfgang König, Langenhain, Taunus; Oswald Zwisler, Marburg-Marbach, and Gerhard Guthorlein, Cappel, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 4, 1974, Ser. No. 503,066

Claims priority, application Germany, Sept. 6, 1973, 2344886

Int. Cl.² C07C *103/52*; C08H *1/00*

U.S. Cl. 260—112.5 R 2 Claims

1. Modified trypsin-callicrein inhibitor wherein the five carboxyl groups present in the unmodified material are amidated by peptide groups of the formula

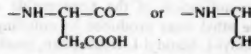
$$-R(R)_xW,$$

wherein R' is

or prolyl; Y is hydrogen, alkyl having 1 to 5 carbon atoms, or alkyl having 1 to 5 carbon atoms substituted by a carboxyl, hydroxyl, or carbonamide group; X is an integer from 0 to 10 such that, if X = 0, then R is

or

and, if X is an integer from 1 to 10, then at least one R is



and W is —OH, —NH_2, —NHC_2H_5, —OCH_3, or —OC_2H_5 when —$R(R)_X$— contains at least two

wherein Y contains carboxy, but is otherwise —OH.

3,953,418

NOVEL HUMAN PROINSULIN C-PEPTIDE DERIVATIVES

Noboru Yanaihara, Shizuoka, and Osamu Ikeda, Tokyo, both of Japan, assignors to Daiichi Radioisotope Laboratories, Ltd., Tokyo, Japan

Filed July 15, 1974, Ser. No. 488,855
Claims priority, application Japan, July 14, 1973, 48-79469
Int. Cl.² C07C *103/52;* **A61K** *37/26*
U.S. Cl. 260—112.7 **6 Claims**

1. A peptide having the amino acid sequence of Arg-Arg-Glu-Ala-Glu-Asp-Leu-Gln-Val-Gly-Gln-Val-Glu-Leu-Gly-Gly-Gly-Pro-Gly-Ala-Gly-Ser-Leu-Gln-Pro-Leu-Ala-Leu-Glu-Gly-Ser-Leu-Gln-Lys-Arg and the N -formyl-Lys-derivative thereof.

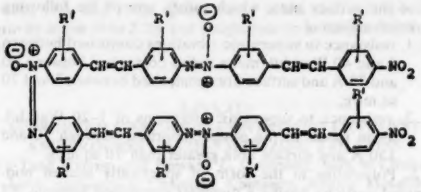
3,953,419

SALTS OF STILBENE-AZO AND STILBENE-AZOXY DYES AND PROCESS FOR THEIR PREPARATION

Reinhard Pedrazzi, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. Nos. 338,339, March 5, 1973, abandoned, and Ser. No. 338,321, March 5, 1973, abandoned. This application Aug. 6, 1973, Ser. No. 385,756
Claims priority, application Switzerland, Aug. 8, 1972, 11699/72; Mar. 17, 1972, 4042/72; Mar. 9, 1972, 3477/72
Int. Cl.² C09B *27/02*
U.S. Cl. 260—143 **19 Claims**

1. A salt of the formula



or a mixture thereof,

wherein each R′ is independently —$SO_3^{\ominus}M^{\oplus}$ or —$SO_3^{\ominus}N^{\oplus}(R)_4$,

wherein each $M^{\oplus}$ is independently hydrogen, lithium, sodium, potassium or ammonium, and

each R is independently alkyl of 1 to 6 carbon atoms or alkyl of 1 to 6 carbon atoms monosubstituted by hydroxy, cyano, chloro, bromo or phenyl,

with the proviso that at least one R′ per molecule is —$SO_3^{\ominus}N^{\oplus}(R)_4$.

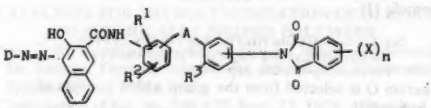
3,953,420

AZO PIGMENTS DERIVED FROM 2-HYDROXY-3-CARBOXYNAPHTHALENE CONTAINING A SUBSTITUTED OR UNSUBSTITUTED PHTHALIMIDE

Peter Dimroth, Lugwigshafen; Frank Dost, Mannhein, and Rolf Urtel, Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen, (Rhine), Germany

Filed Jan. 26, 1973, Ser. No. 326,680
Claims priority, application Germany, Jan. 29, 1972, 2204253; Aug. 19, 1972, 2240927
Int. Cl.² C09B *29/36;* **D06P** *1/08, 5/08*
U.S. Cl. 260—152 **3 Claims**

1. An azo pigment of the formula



wherein:

A is —NHCO— or —CONH—;

D is anthraquinonyl or chlorine-substituted anthraquinonyl with the azo group in the 1- or 2-position; N-phenylphthalimide with the azo group in the 3- or 4-position of the phenyl ring; or phenyl substituted by chlorine, bromine, methyl, methoxy, nitro, cyano, methylsulfonyl or carbomethoxy;

R^1 is hydrogen, chlorine, bromine, methyl, ethyl, methoxy, ethoxy, methylsulfonyl, ethylsulfonyl or cyano;

R^2 is hydrogen, chlorine, bromine, methyl, ethyl, methoxy or ethoxy;

R^3 is hydrogen, chlorine, methyl, ethyl, methoxy or ethoxy;

X is chlorine or bromine; and

n is one of the integers 0, 1, 2, 3 and 4.

3,953,421

PAPER COATING COMPOSITIONS AND ORGANIC PIGMENTS USED THEREIN

Gregor Berstein, Newton, Mass., assignor to Cabot Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 324,338, Jan. 17, 1973, which is a continuation-in-part of Ser. No. 168,467, Aug. 2, 1971, abandoned, which is a continuation-in-part of Ser. No. 59,731, July 3, 1970, abandoned. This application Oct. 11, 1974, Ser. No. 514,090

Int. Cl.² C08L *3/02, 61/20*

U.S. Cl. 260—17.3 13 Claims

1. In a conventional coating color composition suitable for coating paper, paperboard and the like comprising a suitable polymeric binder dissolved or dispersed in an aqueous slurry of finely divided pigment solids, the principal proportion of which by weight are inorganic pigments of less than 2 microns in mean particle size, the improvement which comprises said pigment solids, in an amount of from about 2 to about 25% by weight based upon the total weight of pigment solids employed in the coating color composition, being an essentially water-insoluble, infusible, non-porous, cross-linked urea-formaldehyde pigment in a highly dispersed particulate form having a molar ratio of urea to formaldehyde ranging from about 1:1.3 to about 1:1.8, a BET specific surface area of from about 40 to about 75 square meters per gram, and a mean agglomerate size of from about 2 to about 3.5 microns.

3,953,422

DEOXYGLUCOSE DERIVATIVES

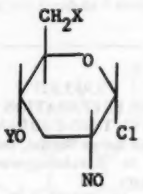
Francis R. Pfeiffer, Cinnaminson, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 17, 1973, Ser. No. 389,091

Int. Cl.² C07G *3/00*

U.S. Cl. 260—210 R 31 Claims

1. A compound of the formula

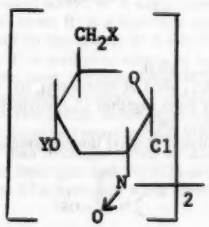


where

X is OY, NHY, or N_3; and

Y is hydrogen or a hydroxy protecting group or amino protecting group,

or a dimer of said compound, said dimer having the formula



3,953,423

PREPARATION OF A NEW FLAVANONE DERIVATIVE

Andreas Hadhanyi, Eschweiler-Bergrath, Germany, assignor to H. Trommsdorff, Aachen, Germany

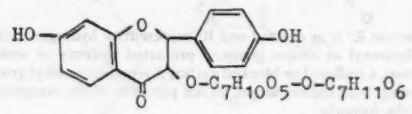
Filed Dec. 5, 1973, Ser. No. 422,055

Claims priority, application Germany, Dec. 8, 1972, 2260214

Int. Cl.² C07G *3/00;* C07H *17/04;* C08B *37/00*

U.S. Cl. 260—210 F 5 Claims

1. A flavanone dimeric methylated hexuronic acid derivative of the formula



2. A method for preparing a flavanone derivative, comprising dispersing in water an extract of roots of glycyrrhiza glabra mixing the dispersion with ethyl urethane and thereby dissolving undesired red dyestuff, rendering the pH moderately acidic thereby to precipitate glycyrrhizinic acid contaminated with yellow dyestuff, separating and discarding the supernatant solution with the red dyestuff, dissolving the precipitate by means of dilute methanolic or ethanolic hydrochloric acid to cleave the sugar moiety from the glycyrrhetinic acid moiety, subjecting the sugar moiety to methylation or ethylation, and separating the precipitated glycyrrhetinic acid portion from the methylation or ethylation product which latter product contains the flavanone derivative.

3,953,424

AZETITIN-2-ORES AND PROCESS FOR PREPARING SAME

Derek Harold Richard Barton, and Peter George Sammes, both of London, England, assignors to Glaxo Laboratories Limited, Greenford, England

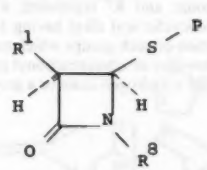
Filed Sept. 12, 1972, Ser. No. 288,353

Claims priority, application United Kingdom, Sept. 21, 1971, 44034/71

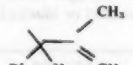
Int. Cl.² C07D *205/08*

U.S. Cl. 260—239 A 6 Claims

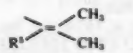
1. A process for the production of azetidin-2-ones having the formula:



wherein P is a saturated or unsaturated, substituted or unsubstituted aliphatic group having at least 2 carbon atoms, R^1 is an amino or blocked amino group, and R^8 represents a hydrogen atom or a group of the formula

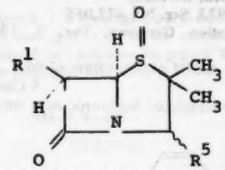


or



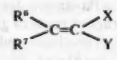
where R^5 represents a hydrogen atom, a protected hydroxyl or amino group, a carboxyl or blocked carboxyl group or a C_{1-30}

alkyl group; which comprises cleaving at a temperature of 50°–140°C a compound of the formula



(II)

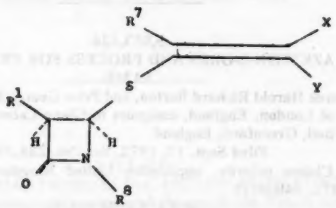
wherein R^1 is as defined and R^5 represents a hydrogen atom, a hydroxyl or amino group, a protected hydroxy or amino group, a carboxyl or blocked carboxyl group or an alkyl group having 1–20 carbon atoms, in the presence of the compound of the formula:



(III)

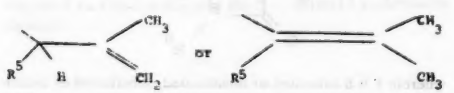
wherein X and Y, which may be the same or different, each represents a hydrogen atom, a halogen atom, or a blocked OH or SH group; and R^6 and R^7 which may be the same or different, each represents a hydrogen atom, C_{1-20} alkyl, monocyclic aryl alkyl having 1–6 carbon atoms in the alkyl portion or such groups which may be substituted by mesyloxy, tosyloxy, or ethoxycarbonyl groups or halogen, or R^7 and Y together constitute a carbon-carbon bond.

6. A compound of the formula V



V

wherein R^1 represents an amino group or a blocked amino group; X and Y which may be the same or different, each represents a hydrogen atom, a halogen atom, or a blocked OH or SH group; and R^7 represents a hydrogen atom, C_{1-20} alkyl, monocyclic aryl alkyl having 1–6 carbon atoms in the alkyl portion or such groups which may be substituted by mesyloxy, tosyloxy or ethoxycarbonyl groups or halogen; and R^8 represents a hydrogen atom or a group of the formula



where R^5 represents a hydrogen atom, a protected hydroxyl or amino group, a carboxyl or blocked carboxyl group or a C_{1-20} alkyl group.

3,953,425

AZEPINE INDANYL AND TETRALIN BUTYROPHENONES

Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 6, 1974, Ser. No. 503,645

Int. Cl.² C07D *223/32, 223/14*

U.S. Cl. 260—239 B **2 Claims**

1. 4′-fluoro-4-[2,3,6,7-tetrahydrospiro[4H-azepine-4,2′-indan]-1(5H)-yl]butyrophenone, hydrochloride.

2. 4′-fluoro-4[2,3,3′,4′,6,7-hexahydrospiro[4H-azepine-4,2′-(1′H)naphthalene]-1-(5H)-yl]butyrophenone, hydrochloride.

3,953,426

CHEMICAL PROCESS AND CHEMICAL COMPOSITIONS

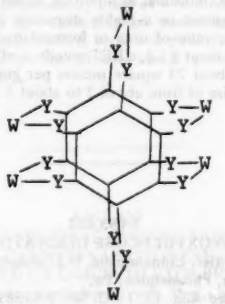
Earl Dan Flickinger, El Dorado, and Charles Merlyn Buess, Wichita, both of Kans., assignors to Skelly Oil Company, Tulsa, Okla.

Division of Ser. No. 359,126, May 10, 1973, Pat. No. 3,860,610, which is a continuation of Ser. No. 68,047, Aug. 28, 1970, abandoned, which is a division of Ser. No. 706,663, Feb. 19, 1968, Pat. No. 3,577,431, which is a continuation-in-part of Ser. No. 554,651, June 2, 1966, abandoned. This application Nov. 6, 1974, Ser. No. 521,256

Int. Cl.² C07D *223/14*

U.S. Cl. 260—239 B **2 Claims**

1. A new composition of matter having two ring nuclei composed of six carbon atoms essentially superimposed in fixed parallel planes with respect to each other and having the formula:



wherein

Y = (CH_2),

W = NR, $NR_2^+X^-$ (R = H or alkyl of 1–4 carbon atoms),

X = chlorine, bromine or iodine, and the Y—W—Y linkages may vary from 3 to 6.

3,953,427

PROCESS FOR THE PREPARATION OF SUBSTITUTED S-ALKYL THIO-CARBAMATES

Gyorgy Matolcsy, and Barna Bordas, both of Budapest, Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

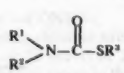
Filed Dec. 18, 1974, Ser. No. 534,096

Claims priority, application Hungary, Jan. 2, 1974, NO 178

Int. Cl.² C07D *223/02;* **C07C** *155/02*

U.S. Cl. 260—239 BF **3 Claims**

1. A process for the preparation of a substituted S-alkyl thiocarbamate having the formula,



wherein

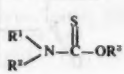
R^1 stands for C_{1-4} alkyl,

R^2 stands for C_{1-4} alkyl or cyclohexyl, or

R^1 and R^2 may form together C_{4-6} polymethylene, and

R^3 stands for C_{2-3} alkyl,

in which a substituted O-alkyl thiocarbamate of the formula,



wherein R^1, R^2 and R^3 each have the same meanings as defined above, is subjected to isomerization by heating it at a temperature of 130° to 180°C, in the presence of dimethyl sulfate or diethyl sulfate.

3,953,428

AMPICILLIN DERIVATIVES SUBSTITUTED BY HETEROCYCLIC ACYL GROUP

Masuo Murakami, Tokyo; Ichiro Isaka; Akio Koda, both of Hoya; Norio Kawahara; Teruya Ashiwagi, both of Ageo; Yukiyasu Murakami, Urawa; Kuniichiro Yano, Tokorozawa; Kohzi Nakano, Shiraoka, and Isao Souzo, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed May 1, 1973, Ser. No. 356,120

Claims priority, application Japan, 1972, 47-45118; 1972, 47-83424; 1972, 47-85102; 1972, 47-85103; 1972, 47-125952; 1973, 48-19917; 1973, 48-38132

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 8 Claims

1. D-α-(4-quinolone-3-carbonylamino--)-benzylpenicillin sodium.

3,953,429

ANAESTHETIC STEROIDS OF THE ANDROSTANCE AND PREGNANE SERIES

Martin Christopher Cook, Chalfont St. Peter; Robin Lawrence, London; Gordon Hanley Phillipps, Wembley; Anne Christine Hunter, Ruislip; Christopher Earle Newall, London; Leslie Stephenson, London, and Niall Galbraith Weir, London, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

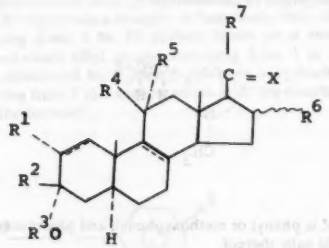
Continuation of Ser. No. 208,959, Dec. 16, 1971, abandoned. This application Feb. 19, 1974, Ser. No. 443,451

Claims priority, application United Kingdom, Dec. 17, 1970, 60064/70

Int. Cl.² C07J *5/00*

U.S. Cl. 260—239.55 R 14 Claims

1. A compound of the formula



wherein R^1 is hydrogen or alkyl of 1–3 carbon atoms; R^2 is a hydrogen atom, methyl or ethyl; R^3 is a hydrogen or atom or tri (chloro or fluoro) acetyl; R^4 is a hydrogen atom, or epoxy linked to the 9 C atom; R^5 is a hydrogen atom; or R^4 and R^5 together represent an oxo group; R^6 is a hydrogen or halogen atom or methyl; R^7 is methyl or alkoxy of 1–6 carbon atoms; and X is an oxygen atom; the dotted lines at the 1(2) and 8(9) positions each indicating a single or double bond provided that there are not two double bonds at both of these positions in the same compound and provided that at least one of R^1, R^2 and R^6 is other than hydrogen when R^4 and R^5 are an oxo group or are both hydrogen and the 1(2) and 8(9) bonds are saturated and that R^1 is hydrogen when there is a 1(2) double bond.

3,953,430

SUBSTITUTED BENZODIAZEPIN-10-ONES AND METHOD OF USE

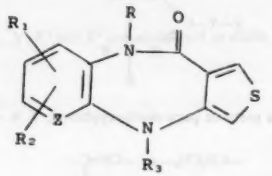
Sidney Robert Safir, River Edge, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 24, 1975, Ser. No. 552,023

Int. Cl.² C07D *513/04, 513/14*

U.S. Cl. 260—239.3 T 17 Claims

1. A compound selected from those of the formula:



wherein Z is selected from the group CH and N; R_1 and R_3 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, halogen, nitro, trifluoromethyl, methylthio, methylsulfonyl and hydroxy; R_2 is selected from the group consisting of hydrogen, lower alkyl and phenylloweralkyl and R is selected from the group comprising hydrogen, diloweralkylaminoloweralkyl, piperidylloweralkyl, morpholinoloweralkyl, pyrrolidinoloweralkyl and piperazinylloweralkyl and acid addition salts thereof, with the proviso that when Z is N, then R_1 and R_2 are hydrogen.

3,953,431

DERIVATIVES OF DIGOXIGENIN

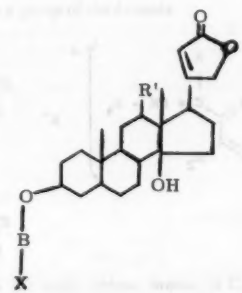
Herman Rutner, Hackensack, N.J.; Raul Rapun, Suffern, and Nathan Lewin, New York, both of N.Y., assignors to Becton, Dickinson & Company, Rutherford, N.J.

Division of Ser. No. 146,545, May 24, 1971, Pat. No. 3,855,208. This application Sept. 28, 1973, Ser. No. 401,816

Int. Cl.² C07J *19/00*

U.S. Cl. 260—239.57 9 Claims

1. A composition of matter comprising a compound having the following structural formula:



wherein

R′ is selected from the group consisting of —OH and $OCOCH_3$;

B is selected from the group consisting of succinyl, maleyl, fumaryl and o-phthaloyl; and

X is selected from the group consisting of —OH and OM wherein M is an alkali metal.

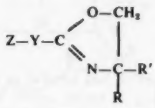
3,953,432

TRANQUILIZERS

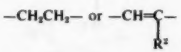
Herbert L. Wehrmeister, Terre Haute, Ind., assignor to Commercial Solvents Corporation, Terre Haute, Ind.

Filed Dec. 4, 1972, Ser. No. 312,242
Int. Cl.² C07D 263/14, 265/08
U.S. Cl. 260—240 E 8 Claims

1. A compound represented by the formula



wherein Z is meta or para-methoxyphenyl; Y is $-CH_2-$,



with the proviso that the CR^2 moiety is bonded to the oxazoline ring, where R^2 is hydrogen, methyl or 4-methoxypheny; R and R′ are methyl except that when Y is $-CH_2-$, R and R′ are methyl or R is hydrogen and R′ is ethyl.

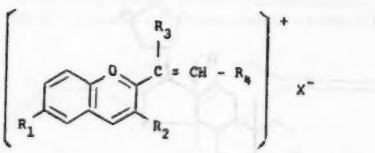
3,953,433

SENSITIZER FOR USE IN ELECTROPHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Shoji Maruyama, Sagamihara; Tomio Kubota; Katue Kojima, both of Tokyo; Hiroshi Tamura, Kawasaki, and Masahide Harada, Tokyo, all of Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

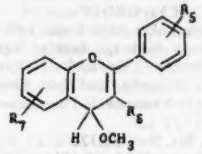
Continuation-in-part of Ser. No. 259,558, June 5, 1972, abandoned. This application Jan. 3, 1974, Ser. No. 430,587
Claims priority, application Japan, June 22, 1971, 46-45063
Int. Cl.² C07D 311/04; G03G 5/06
U.S. Cl. 260—240 D 24 Claims

1. A sensitizer for an electrophotographic light-sensitive material including an organic photoconductor, which is a reaction product comprising 1 part by weight of a benzopyrylium salt having the following general formula (I):



(I)

wherein R_1 is a halogen atom, or a methyl, ethyl, alkoxyl, nitro or cyano group; R_2 is a hydrogen atom, or a methyl, ethyl, phenyl or alkoxyphenyl group; R_3 is a hydrogen atom or an alkyl group of C_1 to C_4; R_4 is a phenyl group, or a phenyl group substituted by a halo, methyl, ethyl, carboxyl, alkoxyl, nitro or cyano substituent; and X^- is Cl^-, Br^-, I^-, CAO_4^-, IO_4^- or BF_4^-, and from 0.5 to 2 parts by weight of a benzopyran having the following general formula (II′):



(II′)

wherein R_5 is a hydrogen or halogen atom, or a methyl, methoxyl, nitro or amino group; R_6 is same as R_2 of the general formula (I); R_7 is a hydrogen or halogen atom, or a methyl, ethyl, alkoxyl, nitro or cyano group.

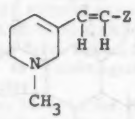
3,953,434

DIENES USEFUL IN THE PREPARATION OF 1,2,3,4,4A,5,6,7-OCTAHYDRO-7-ARYL-ISOQUINOLINES

Frederick Peter Hauck, Somerville, N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 295,385, Oct. 5, 1972, Pat. No. 3,901,897.
This application Apr. 11, 1975, Ser. No. 567,347
Int. Cl.² C07D 211/70
U.S. Cl. 260—240 D 9 Claims

1. A compound of the formula:



wherein Z is phenyl or methoxyphenyl; and pharmaceutically acceptable salts thereof.

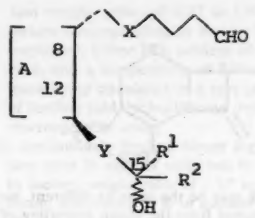
3,953,435

ALDEHYDE DERIVATIVES OF PROSTAGLANDINS

Masaki Hayashi; Seiji Kori, both of Takatsuki, and Hirofumi Endo, Osaka, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

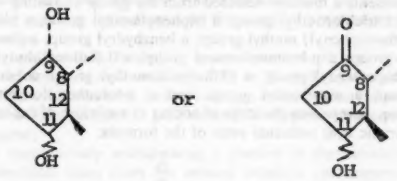
Filed Dec. 30, 1974, Ser. No. 537,522
Claims priority, application United Kingdom, Jan. 10, 1974, 1278/74; Oct. 9, 1974, 43777/74; Oct. 22, 1974, 45684/74
Int. Cl.² C07C 177/00
U.S. Cl. 260—240 R 26 Claims

1. A compound of the formula:



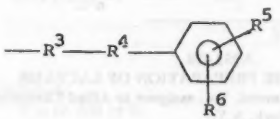
VI

wherein A represents a grouping of the formula:



VIIA VIIB

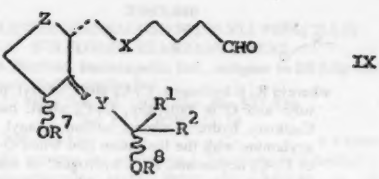
X represents ethylene or cis-vinylene, Y represents ethylene or trans-vinylene, R^1 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, R^2 represents a straight- or branched-chain alkyl group containing from 1 to 10 carbon atoms or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms substituted by a phenyl group or a cycloalkyl group containing from 5 to 7 carbon atoms or R^2 represents a grouping of the formula:



VIII

wherein R^3 represents a straight- or branched-chain alkylene group containing from 1 to 4 carbon atoms, R^4 represents an oxygen or sulphur atom or a sulphinyl group, and R^5 and R^6 each represent a hydrogen or halogen atom, a trifluoromethyl group or an alkyl group containing from 1 to 3 carbon atoms, and cyclodextrin clathrates of such aldehydes and acetal derivatives thereof with an alcohol or diol.

19. A compound of the formulae:



IX

wherein X, Y, R^1 and R^2 are as defined in claim 1, Z represents

or C=O, R^7 represents a 2-tetrahydropyranyl group unsubstituted or substituted by at least one alkyl group, or a 2-tetrahydrofuranyl or 1-ethoxyethyl group, and R^8 represents a hydrogen atom or a 2-tetrahydropyranyl group unsubstituted or substituted by at least one alkyl group, or a 2-tetrahydrofuranyl or 1-ethoxyethyl group.

3,953,436

3,4-DICARBOXYCEPHALOSPORINS AND DERIVATIVES

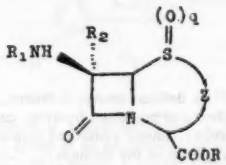
Douglas O. Spry, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 19, 1974, Ser. No. 462,459

Int. Cl.² C07D *501/18, 501/24, 501/60*

U.S. Cl. 260—243 C **31 Claims**

1. The compound of the formula



wherein Z is a group of the formula

or

wherein X is a. azido, chloro, bromo, or C_2-C_5 alkylcarbonyldioxy; or

b. a group of the formula $-OR_3$ wherein R_3 is hydrogen, C_1-C_6 alkyl, C_2-C_6 haloalkyl, 2,2,2-trihaloethyl, methoxybenzyl, nitrobenzyl, benzyl, diphenylmethyl, C_2-C_5 alkanoyloxymethyl, phenyl or a pharmaceutically acceptable non-toxic cation; or

c. a group of the formula $-SR_4$ wherein R_4 is C_1-C_6 alkyl, phenyl, benzyl, 1-methyl-1,2,3,4-tetrazol-5-yl or 1,3,4-thiadiazol-2-yl; or

d. a group of the formula

wherein R_5 is hydrogen, C_1-C_6 alkyl, benzyl, phenyl, or tolyl and Q is hydrogen, C_1-C_6 alkyl, benzyl, C_1-C_7alkoxy, hydroxy, amino, anilino, guanyl, or C_1-C_3 acylamino with the limitation that when Q is guanyl or C_1-C_3 acylamino, R_5 is hydrogen; or wherein R_5, Q, and the nitrogen atom taken together form a 5 or 6 membered ring; and

wherein R is hydrogen or a carboxylic acid protecting ester forming group; and when R is hydrogen, the pharmaceutically acceptable non-toxic salts of the acids represented thereby; and

wherein R_1 is hydrogen or an acyl group of the formula

wherein R′ is a. C_1-C_7 alkyl, C_3-C_7 alkenyl, cyanomethyl, halomethyl, 4-protected amino-4-protected carboxylbutyl; or

b. the group -R″ wherein R″ is 1,4-cyclohexyldienyl, phenyl, or substituted phenyl wherein the substituents are 1–3 halogens, hydroxy, nitro, cyano, trifluoromethyl, C_1-C_4 alkyl, C_1-C_4 alkoxy, hydroxymethyl, or protected aminomethyl; or

c. an arylalkyl group of the formula

wherein R″ is as defined above,

Y is O or S, and

m is 0 or 1; or

d. a substituted arylalkyl group of the formula

wherein R‴ is R″ as defined above, 2-thienyl, or 3-thienyl; W is hydroxy or protected hydroxy, carboxy or protected carboxy, amino, protected amino; or

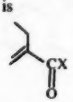
e. a heteroarylmethyl group of the formula

wherein R⁗is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-thiazolyl, 5-tetrazolyl or 1-tetrazolyl; and

wherein R_2 is hydrogen or methoxy; and

q is 1 or 0 with the limitation that when *q* is 1,

Z is



and R_2 is hydrogen.

3,953,437

PROCESS OF PREPARING CEPHALOSPORANIC ACID ESTER DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo, and Teruaki Ozasa, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

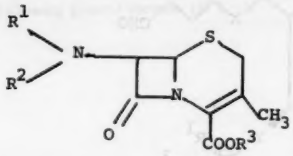
Filed Mar. 8, 1974, Ser. No. 449,374

Claims priority, application Japan, Mar. 14, 1973, 48-29703

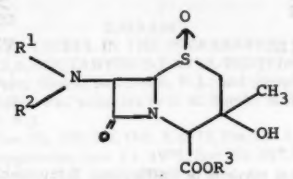
Int. Cl.² C07D *501/04*

U.S. Cl. 260—243 C **4 Claims**

1. A process of preparing a Δ^3-cephalosporanic acid ester of the formula



wherein R^1 and R^2 which may be the same or different, each represent a member selected from the group consisting of a straight or branched chain alkyl group of 1 to 4 carbon atoms, a cyclohexyl group, a benzyl group, a phenethyl group, a furylethyl group a pyridylmethyl group, a trifluoromethyl group, a methoxymethyl group, a phenoxyethyl group, a benzylthioethyl group, a phenyl group, a naphthyl group, a quinolyl group, a tolyl group, a nitrophenyl group, an acetyl group, a phenylacetyl group, a cyclohexylacetyl group, a benzoyl group, an alpha-phenoxyacetyl group, an acetamido group, a dimethoxy phosphinyl group and a trimethyl silyl group and R^1 and R^2 taken together forming a member selected from the group consisting of a salicylidene group and a benzylidene group, a phthaloyl group, a 1,1-dimethyl-3-phenyl-2-nitroso-4-oxo-2-azatetramethylene group and succinyl group, and R^3 represents a member selected from the group consisting of a 2,2,2-trichloroethyl group, a triphenylmethyl group, a bis(p-methoxyphenyl) methyl group, a benzhydryl group, a phenacyl group, a p-bromophenacyl group, a 3,5-di-tert.-butyl-4-hydroxybenzyl group, a phthalimidomethyl group, a benzyl group, a nitrobenzyl group, and a p-toluenesulfonylethyl group, comprising the steps of adding to a mixture of cephalosporanic acid sulfoxide ester of the formula:



in which R^1, R^2 and R^3 are as defined above in an inert solvent under cooling an excessive amount of a compound of the formula

PX_3

in which X is halogen and a more than equimolar amount with respect to PX_3 of a tertiary base, and recovering said Δ^3-cephalosporanic acid ester.

3,953,438

PROCESS FOR THE PREPARATION OF LACTAMS

Joseph A. Smith, Richmond, Va., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 7, 1975, Ser. No. 548,064

Int. Cl.² C07D *201/04*

U.S. Cl. 260—239.3 A **9 Claims**

1. A process for the production of monocyclic lactams having 5 to 12 ring carbon atoms and one ring nitrogen atom by the catalytic rearrangement of a cycloalkanone oxime having 5 to 12 carbon atoms in the ring in the presence of oleum, comprising:

(a) continuously feeding a first portion of said cycloalkanone oxime consisting of 65 to 85 parts by weight of said cycloalkanone oxime having a water content of up to 6 weight percent to a first catalytic rearrangement zone containing a circulating reaction mass having a sulfuric acid to lac-

tam weight ratio of 1.37 to 1.80, said lactam being the lactam corresponding to the cycloalkanone oxime being employed, a free SO_3 content of 2.4 to 14.0 weight percent, and a temperature of 50° to 105° C., said reaction mass being circulated at a rate at least 20 times the rate of feeding said cycloalkanone oxime to said first catalytic rearrangement zone;

(b) continuously feeding oleum to said first catalytic reaction zone in amount sufficient to maintain a sulfuric acid to lactam weight ratio of 1.37 to 1.80 in said zone, said oleum containing SO_3 in amount sufficient to react with all of the water in said cycloalkanone oxime and maintain the free SO_3 content of the circulating reaction mass at 2.4 to 14.0 weight percent;

(c) continuously feeding a portion of the circulating reaction mass from the first catalytic rearrangement zone substantially equivalent to the feed of cycloalkanone oxime to said zone, to a second catalytic rearrangment zone containing a circulating reaction mass having a sulfuric acid to lactam weight ratio of at least 1.14, a free SO_3 content of at least 0.82 weight percent, and a temperature of 70° to 100° C., said reaction mass in said second catalytic rearrangement zone being circulated at a rate of at least 20 times the rate of feeding to said second catalytic rearrangement zone said portion of the circulating reaction mass from said first catalytic rearrangement zone;

(d) continuously feeding a second portion of said cycloalkanone oxime consisting of 15 to 35 parts by weight of said cycloalkanone oxime having a water content of up to 6 weight percent to said second catalytic rearrangement zone;

(e) continuously withdrawing a portion of the circulating reaction mass from the second catalytic rearrangement zone substantially equivalent to the feed to said zone; and

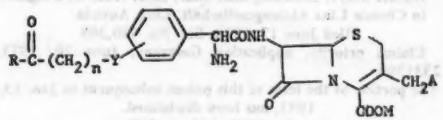
(f) recovering lactam from the portion of the circulating reaction mass withdrawn from the second catalytic rearrangement zone.

3,953,439
SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS

John Gerald Gleason, Cornwells Heights, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed Aug. 1, 1973, Ser. No. 384,771
Int. Cl.² C07D *501/20*
U.S. Cl. 260—243 C **20 Claims**

1. A compound of the formula:



in which:

Y is O, NH or S;

n is one to five;

R is NH_2 or OR′, where R′ is hydrogen or lower alkyl of from one to four carbon atoms;

M is hydrogen or an alkali metal or ammonium cation;

A is SHet; and

Het is a five or six membered heterocyclic group containing carbon and one to four atoms selected from the group consisting of N, O and S, each such group being unsubstituted or substituted with from one to two groups selected from lower alkyl, alkoxyalkyl, each alkoxy or alkyl having from one to four carbon atoms, hydroxy, trifluoromethyl and SR′, where R′ is hydrogen or alkyl of from one to four carbon atoms.

3,953,440
DEACETOXYCEPHALOSPORINS VIA PENICILLIN SULFOXIDE REARRANGEMENT

Lowell D. Hatfield, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 13, 1974, Ser. No. 532,536
Int. Cl.² C07D *501/10*
U.S. Cl. 260—243 C **6 Claims**

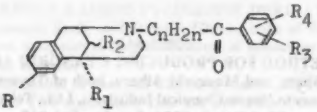
1. In the process for preparing a 7-acylamido-3-methyl-3-cephem-4-carboxylic acid ester by heating a 6-acylamidopenicillanic acid ester sulfoxide in an inert solvent in the presence of an acidic catalyst, the improvement which comprises heating the penicillin sulfoxide in 1,1,2-trichloroethane in the presence of an amine salt of dichloromethanephosphonic acid wherein the amine salt is formed with an amine selected from the group consisting of pyridine, quinoline, isoquinoline and the methyl substituted derivatives thereof.

3,953,441
PREPARATION OF 2-BENZOYLALKYLBENZOMORPHAN

Toshio Atsumi; Kenji Kobayashi; Yoshiaki Takebayashi, all of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

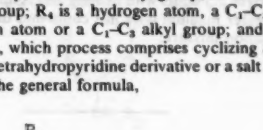
Filed June 7, 1971, Ser. No. 150,841
Claims priority, application Japan, June 10, 1970, 45-50665; June 10, 1970, 45-50666; June 30, 1970, 45-57649
Int. Cl.² C07D *221/26*
U.S. Cl. 260—293.54 **9 Claims**

1. A process for preparing 2-substituted 6,7-benzomorphan derivatives, and salts thereof, represented by the general formula,



[I]

wherein R is a hydrogen atom, a hydroxyl group, a C_1–C_3 alkoxy group or an alkanoyloxy group; R_1 is a hydrogen atom, a C_1–C_3 alkyl group, a phenyl group, a halophenyl group, a C_1–C_3 alkylphenyl group, a C_1–C_3 alkoxyphenyl group, a hydroxyphenyl group, a trifluoromethylphenyl group, a nitrophenyl group, an aminophenyl group, a C_1–C_3 alkylthiophenyl group or an alkanoyloxyphenyl group; R_2 is a hydrogen atom or a C_1–C_3 alkyl group; R_3 is a hydrogen atom, a halogen atom, a C_1–C_3 alkyl group, a C_1–C_3 alkoxy group, a C_1–C_3 alkylthio group, a nitro group, a trifluoromethyl group, an amino group or a hydroxyl group; R_4 is a hydrogen atom, a C_1–C_3 alkoxy group, a halogen atom or a C_1–C_3 alkyl group; and *n* is an integer of 2 to 4, which process comprises cyclizing a 1-substituted 1,2,5,6-tetrahydropyridine derivative or a salt thereof, represented by the general formula,



[II]

wherein R_1, R_2, R_3, R_4 and *n* are as defined above; Y is an oxygen atom or an ethylenedioxy group; and R′ is a hydrogen atom or a C_1–C_3 alkoxy group.

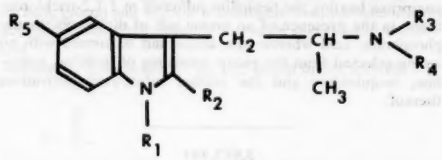
3,953,442

3-(AMINOPROPYL)INDOLES

Henri Demarne, Herault, France, assignor to Clin Midy, Paris, France

Filed Feb. 16, 1973, Ser. No. 333,343
Claims priority, application France, Feb. 16, 1972, 72.05196
Int. Cl.² C07D 209/14
U.S. Cl. 260—247.5 FP 8 Claims

1. A 3-(aminopropyl)indole having the general formula



in which R_1 is selected from the group consisting of phenyl, halophenyl, nitrophenyl, aminophenyl, lower alkoxyphenyl and pyridyl, R_2 is selected from the group consisting of hydrogen and methyl, $-NR_3R_4$ is pyrrolidino, piperidino or morpholino and R_5 is selected from the group consisting of hydrogen, fluorine, chlorine and methoxy, together with salts of said amines with pharmacologically acceptable mineral and organic acids.

3,953,443

METHOD FOR PRODUCING CYANURIC ACID

Yoichi Ohata, and Masayuki Aihara, both of Toyama, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Oct. 3, 1974, Ser. No. 511,918
Claims priority, application Japan, Oct. 5, 1973, 48-111477
Int. Cl.² C07D 251/32
U.S. Cl. 260—248 A 4 Claims

1. A method of producing cyanuric acid by heating urea in bulk comprising supplying urea continuously under agitation into a reaction vessel, the heat transfer surface of which is maintained at a temperature higher then 340°C, said vessel being equipped with an agitator and heated indirectly by a heat transfer medium, maintaining the reaction mixture permanently at a temperature higher than 220°C in any local point, and carrying out the reaction with a mean residence time of over 2.5 hours with heating and agitating, wherein said heat transfer medium does not come into direct contact with said reaction mixture.

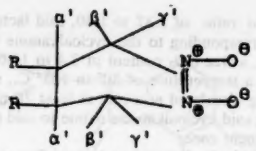
3,953,444

CYCLIC AND POLYCYCLIC DIAZADIOXIDES AS QUENCHERS AND RADICAL INHIBITORS

Prithipal Singh, Sunnyvale, and Edwin F. Ullman, Atherton, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 196,724, Nov. 8, 1971, abandoned. This application May 9, 1973, Ser. No. 358,758
Int. Cl.² C07D 237/26
U.S. Cl. 260—250 AC 3 Claims

1. Compound of the formula:



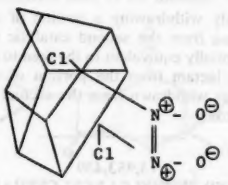
wherein:

the two α's and the β's are taken together to form a saturated unsubstituted aliphatic tetravalent group of from 2 to 12 carbon atoms;

the two γ's are the same or different and are saturated aliphatic hydrocarbon of from 1 to 6 carbon atoms, halogen of atomic number 9 to 35 or hydrogen; and

the two R's are the same or different and are hydrogen, saturated aliphatic hydrocarbon of from 1 to 6 carbon atoms or halogen of atomic number 9 to 35.

3. Hexacyclo[8,2,1,$0^{2,9}$,$0^{3,8}$,$0^{7,11}$,$0^{4,12}$]-dodeca-4,7-dichloro-5-en-5,6-diaza-5,6-dioxide, of the formula:



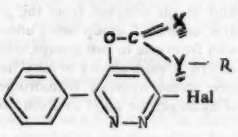
3,953,445

3-PHENYL-6-HALO-PYRIDAZINYL THIO-AND DITHIO-CARBONATES

Rupert Schonbeck, Leonding near Linz; Engelbert Kloimstein, Eferding; Alfred Diskus; Engelbert Auer, both of Linz, and Hubert Mayr, Leonding near Linz, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed June 17, 1974, Ser. No. 480,309
Claims priority, application Germany, June 20, 1973, 2331398
The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.
Int. Cl.² C07D 237/14, 237/16
U.S. Cl. 260—250 A 20 Claims

1. A Phenylpyridazine having the formula:



(1)

in which Hal is selected from the group consisting of chlorine or bromine, R is selected from the group consisting of straight chain alkyl and branched alkyl, both having up to 12 carbon atoms and phenyl, and X and Y are selected from the group consisting of oxygen and sulphur, whereby one of X and Y always is sulphur.

3,953,446

PROCESS FOR PREPARING QUINAZOLINES

Kikuo Ishizumi, Toyonaka; Kazuo Mori, Kobe; Michihiro Yamamoto, Nishinomiya; Masao Koshiba, Amagasaki; Shigeho Inaba, Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

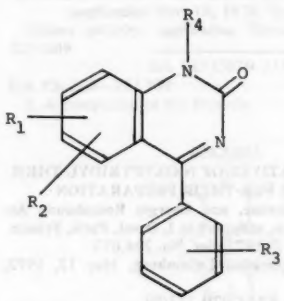
Filed Aug. 5, 1974, Ser. No. 494,885

Claims priority, application Japan, Aug. 20, 1973, 48-93678

Int. Cl.[2] C07D *239/82*, *405/04*, *405/06*, *409/06*

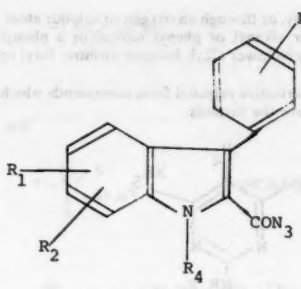
U.S. Cl. 260—251 QB 2 Claims

1. A process for preparing a quinazolinone of the formula,



(I)

wherein R_1, R_2 and R_3 are independently a hydrogen atom, a halogen atom, a C_1–C_4 alkylsulfonyl group, a C_1–C_4 alkyl group provided that for R_1 and R_2 said alkyl group is a straight chain C_1–C_4 alkyl group, a C_1–C_4 alkoxy group or a C_1–C_4 alkylthio group; and R_4 is a hydrogen atom, a C_1–C_4 alkyl group, benzyl, a C_1–C_4 alkoxy-C_1–C_4 alkyl group, a polyhalo C_1–C_4 alkyl group, a cyclo C_5–C_8 alkyl group, a cyclo C_5–C_8 alkyl -C_1–C_4 alkyl group, a tetrahydrofurfuryl group, a furylmethyl group or a thienylmethyl group, which comprises the set of reacting an indole-2-carbonylazide of the formula,



(III)

wherein R_1, R_2, R_3 and R_4 are as defined above, with an oxidizing agent selected from the group consisting of ozone, hydrogen peroxide, performic acid, peracetic acid, perbenzoic acid, chromic acid, halogen and hypohalite of sodium, potassium or calcium in the presence of a solvent.

3,953,447

ESTERIFIED 2-AMINO PYRIMIDINE DERIVATIVES

Brian Kenneth Snell, and Ranajit Ghosh, both of Bracknell, England, assignors to Imperial Chemical Industries Limited, London, England

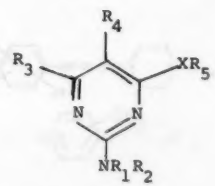
Continuation of Ser. No. 623,810, March 17, 1967, abandoned. This application Jan. 27, 1971, Ser. No. 110,275

Claims priority, application United Kingdom, Mar. 31, 1966, 14270/66

Int. Cl.[2] C07D *239/14*

U.S. Cl. 260—256.4 C 6 Claims

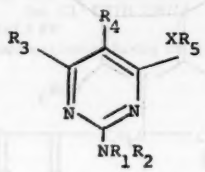
1. A pyrimidine derivative selected from the group consisting of compounds having the formula:



and the hydrochloride salts thereof, wherein R_1 and R_2 are hydrogen, lower alkyl or halophenyl or together with the adjacent N-atom form a piperidino, morpholino or piperazino ring; R_3 and R_4 are hydrogen, halogen, a lower alkyl, lower alkenyl, phenyl or benzyl radical or nitro; X represents an atom of oxygen or sulphur; and R_5 is a carbonyl or sulphonyl

group bearing directly, or through an oxygen or sulphur atom, a lower alkyl, lower alkenyl or phenyl radical or a phenyl radical substituted with lower alkyl, halogen or nitro; furyl or piperidino.

6. A pyrimidine derivative selected from compounds which in free base form have the formula:



wherein R_1 and R_2 are hydrogen, lower alkyl or halophenyl or together with the adjacent N-atom form a piperidino, morpholino or piperazino ring; R_3 and R_4 are hydrogen, halogen, a lower alkyl, lower alkenyl, phenyl or benzyl radical or nitro; X represents an atom of oxygen or sulphur; and R_5 is a carbonyl or sulphonyl group bearing directly, or through an oxygen or sulphur atom, a lower alkyl, lower alkenyl or phenyl radical or nitro; furyl or piperidino and the rest of the ring being composed of carbon and hydrogen.

3,953,448

PIPERAZINO-ANILIDO COMPOUNDS

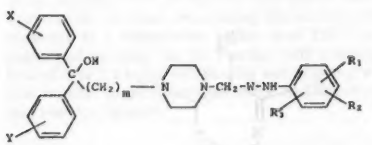
Ctirad Podesva, Montreal; William T. Scott, Ville de Lery, and David W. Henson, LaSalle, all of Canada, assignors to Delmar Chemicals Limited, Ville LaSalle, Canada

Filed Dec. 7, 1972, Ser. No. 311,702

Int. Cl.² C07D *295/10, 295/12*

U.S. Cl. 260—268 BZ 12 Claims

1. A 1,4-disubstituted piperazine compound having the formula:



(I)

wherein X or Y is a halogen and the other is hydrogen or halogen, R_1, R_2 and R_3 are hydrogen, halogen, alkyl having 1 to 3 carbon atoms or alkoxy having 1 to 3 carbon atoms, W is carbonyl or methylene, and *m* is 1, 2 or 3; or a non-toxic acid addition salt thereof.

3,953,449

2-(4-M-CF_3 OR -SCF_3 PHENYLPIPERAZINO)-ETHYL BENZOATES

Don Pierre Rene Lucien Giudicelli, Fontenay-sous-Bois; Henry Najer; Bogdan Iliesco-Branceni, both of Paris; Philippe Michel Jacques Manoury, L'Hay-les-Roses, and Andre Pierre Fernand Dumas, Bagneux, all of France, assignors to Synthelabo, Paris, France

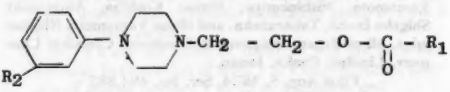
Filed May 6, 1974, Ser. No. 467,595

Claims priority, application France, May 9, 1973, 73.16634; Jan. 29, 1974, 74.02793

Int. Cl.² C07D *295/08*

U.S. Cl. 260—268 PH 8 Claims

1. A compound of the formula



R_1 is phenyl, 2-methoxy-5-chloro phenyl, 3,4,5-trimethoxy-phenol, 2-hydroxyphenyl, 2-acetoxyphenyl, 2- or 4-amino-phenyl, 2-(m-trifluoromethyl-phenylamino)-phenyl or 2-(m-trifluoromethylthio-phenylamino)-phenyl; and

R_2 is CF_3 or SCF_3 or an acid addition salt thereof with a pharmaceutically acceptable organic or inorganic acid.

3,953,450

ALUMINUM DERIVATIVES OF N-OXYPYRIDYL THIOL AND PROCESS FOR THEIR PREPARATION

Claude Bouillon, Eaubonne, and Georges Rosenbaum, Asnieres, both of France, assignors to L'Oreal, Paris, France

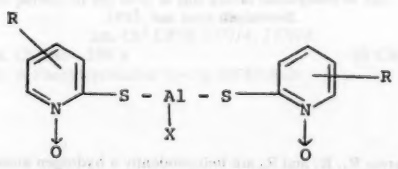
Filed Oct. 2, 1972, Ser. No. 294,072

Claims priority, application Luxemburg, May 12, 1972, 65350

Int. Cl.² C07D *213/89*

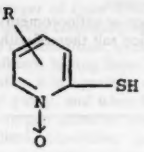
U.S. Cl. 260—270 K 9 Claims

1. A compound of the formula



wherein X is selected from the group consisting of chlorine and bromine and R represents a member selected from the group consisting of chlorine, methyl and methoxy.

8. A process for preparing a compound of claim 1 comprising reacting in an anhydrous solvent selected from the group consisting of methanol, ethanol, isopropanol, tertio-butyl alcohol, benzene, toluene, chloroform and dichlorethane. a 2-pyridine thiol N-oxide of the formula



wherein R represents a member selected from the group consisting of hydrogen, chlorine, methyl and methoxy, with aluminum isopropylate and reacting the resulting reaction product with an acid selected from the group consisting of gaseous hydrochloric acid and gaseous hydrobromic acid.

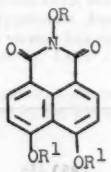
3,953,451

COMPOUNDS OF THE NAPHTHALIMIDE SERIES

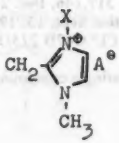
Renate Elisabeth Hell, Frankenthal, and Horst Scheuermann, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 373,114, June 25, 1973, abandoned. This application Nov. 18, 1974, Ser. No. 524,783
Claims priority, application Germany, June 28, 1972, 2231609
Int. Cl.[2] C07D 217/24
U.S. Cl. 260—281 NH 4 Claims

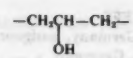
1. A compound of the formula



in which
R is -alkylene-T or

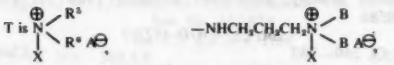


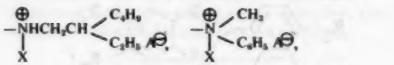
alkylene is $-CH_2CH_2-$, $-CH_2CH_2CH_2-$, $-CH_2CHCH_3$,

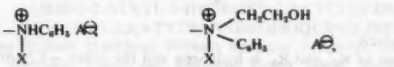


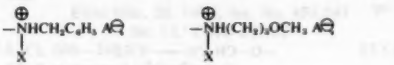
or

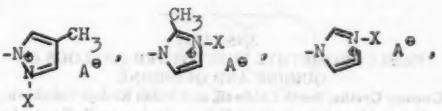
and

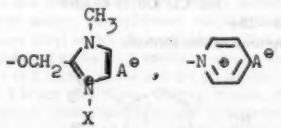




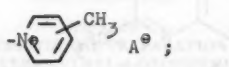








or



R^5 is alkyl of 1 to 4 carbon atoms or β-hydroxyethyl,
R^6 is hydrogen, alkyl of 1 to 4 carbon atoms or β-hydroxyethyl,
R^5 and R^6 together with the nitrogen are pyrrolidino or piperidino,
X is methyl, ethyl, propyl or benzyl,
R^1 is C_1- to C_4-alkyl,
B is C_1- to C_4-alkyl or C_2H_4OH and
A^- is chloride, bromide, iodide, sulfate, methosulfate, ethosulfate, benzene-sulfonate or toluenesulfonate.

3,953,452

PERINONE DYESTUFFS

Winfried Kruckenberg, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

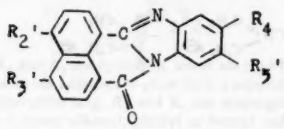
Continuation-in-part of Ser. No. 291,548, Sept. 25, 1972, abandoned, which is a continuation of Ser. No. 15,291, Feb. 27, 1970, abandoned. This application Jan. 3, 1974, Ser. No. 430,382

Claims priority, application Germany, Mar. 1, 1969, 1910586

Int. Cl.² C07D 487/02

U.S. Cl. 260—282 6 Claims

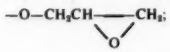
1. Perinone dyestuff having the formula



in which

one of R_2' and R_3' is hydrogen and the other —CN or —$CO_2C_pH_{2p+1}$;

one of R_4' and R_5' is hydrogen and the other C_1—C_4-alkoxy or



and

P is a whole number from 1 to 4.

3,953,453

TRIFLUOROMETHYL SUBSTITUTED ANALOGS OF QUININE AND QUINIDINE

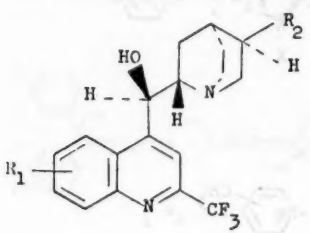
Guenter Grethe, North Caldwell, and Milan Radoje Uskokovic, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 422,645, Dec. 7, 1973, abandoned. This application Nov. 11, 1974, Ser. No. 522,677

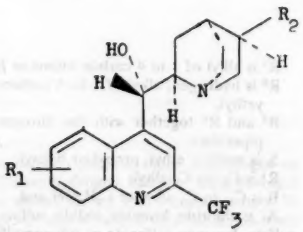
Int. Cl.² C07D 453/04

U.S. Cl. 260—284 21 Claims

1. A compound of the formula



and



its enantiomer or racemate,

wherein R_1 is halogen or trifluoromethyl; and R_2 is ethyl or vinyl, or an addition salt thereof with a pharmaceutically acceptable acid.

3,953,454

N-(D-6-METHYL-8-ISOERGOLINE-I-YL)-N',N'-DIETHYLUREA

Viktor Zikán; Miroslav Semonský; Karel Řezáček; Miroslav Sěda, and Marie Aušková, all of Prague, Czechoslovakia, assignors to SPOFA, United Pharmeceutical Works, Prague, Czechoslovakia

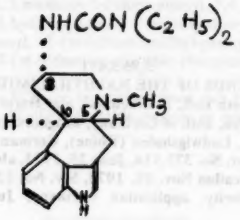
Filed Aug. 7, 1972, Ser. No. 278,367

Claims priority, application Czechoslovakia, Aug. 5, 1971, 5689-71; Aug. 5, 1971, 5709-71

Int. Cl.² C07D 457/06

U.S. Cl. 260—285.5 3 Claims

1. N-(D-6-methyl-8-isoergoline-I-yl)-N,', N'-diethyl-urea of the formula



and its hydrogen maleate and tartrate salts

3,953,455

DERIVATIVES OF 6(5H)-PHENANTHRIDINONE AND A METHOD FOR PREPARATION

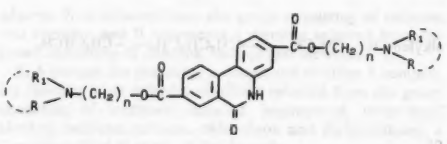
Donald R. Meyer, and Arthur D. Sill, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 317,146, Dec. 21, 1972, Pat. No. 3,859,312. This application Sept. 13, 1974, Ser. No. 505,662

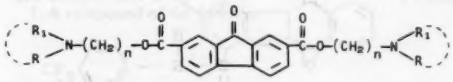
Int. Cl.² C07D 215/32

U.S. Cl. 260—286 A 4 Claims

4. A method for preparing a compound having the formula:



wherein *n* is an integer of from 2 to 6, R and R_1 are each selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than in the 1-position of the alkenyl group, and when R and R_1 are taken together with the nitrogen atom to which they are attached, represent pyrrolidinyl, piperidino and morpholino, which comprises the step of reacting a bis(aminoalkyl) 9-oxo-fluorene-2,7-dicarboxylate having the formula:



wherein the symbols *n*, R and R_1 have the values previously described, or a salt thereof, with hydrazoic acid; and isolating the resulting product therefrom.

3,953,456

CARBOSTYRIL DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Kazuyuki Nakagawa, Tokushima; Shiro Yoshizaki, Komatsushima; Nanami Murakami, and Hideo Mori, both of Tokushima, all of Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan

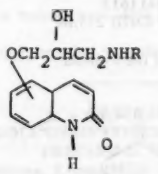
Filed Dec. 14, 1973, Ser. No. 424,965

Claims priority, application Japan, Dec. 14, 1972, 47-125857

Int. Cl.² C07D *215/22*

U.S. Cl. 260—288 R **6 Claims**

1. A 5- or 8- (2-Hydroxy-3-alkylamino)propoxycarbostyril compound represented by the formula (I):



(I)

wherein R represents a straight or branched alkyl group having 1 to 4 carbon atoms, and the pharmaceutically acceptable acid addition salts thereof.

3,953,457

AGENT FOR THE CONTROL OF PLANT-PATHOGENIC ORGANISMS

Barry A. Dreikorn, and Kenneth E. Kramer, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 275,984, July 28, 1972, Pat. No. 3,839,569, which is a continuation-in-part of Ser. No. 172,317, Aug. 16, 1971, abandoned. This application Feb. 15, 1974, Ser. No. 443,074

Int. Cl.² C07D *471/04*

U.S. Cl. 260—288 CF **5 Claims**

1. A compound selected from the group consisting of 4,5-dihydro-s-triazolo(4,3-a)quinoline, 4,5-dihydro-1-methyl-s-triazolo(4,3-a)quinoline, 9-chloro-4,5-dihydro-s-triazolo(4,3-a)quinoline, and 4,5-dihydro-9-methyl-s-triazolo(4,3-a)quinoline.

3,953,458

1-SUBSTITUTED AMINO-2-ALKYL-5-HYDROXY-7,8-CYCLOPENTANO[H]-1,2,3,4-TETRAHYDROISOQUINOLINES

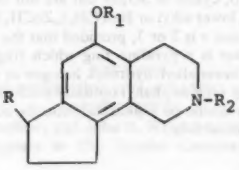
Ian William Mathison; William Ebenezer Solomons, both of Memphis, Tenn., and Raymond Henry Jones, Northport, N.Y., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Mar. 28, 1974, Ser. No. 455,561

Int. Cl.² C07D *217/02*

U.S. Cl. 260—288 CF **13 Claims**

12. A compound of the formula



wherein R is a phenyl-lower alkyl amino, substituted phenyl-lower alkyl amino, phenyl-lower alkyl imino, substituted phenyl-lower alkyl imino, diphenyl-lower alkyl amino or substituted diphenyl-lower alkyl amino in which groups the lower alkyl has 1 to 8 carbon atoms and the substituted phenyl group have 1 to 3 lower alkyl, lower alkoxy, bromo, chloro, fluoro, nitro, hydroxy, methylenedioxy and trifluoromethyl groups with said lower alkyl and lower alkoxy groups having 1 to 8 carbon atoms, R_1 is hydrogen or a lower alkyl having 1 to 8 carbon atoms and R_2 is a lower alkyl group having 1 to 8 carbon atoms, and non-toxic acid addition salts and non-toxic quaternary ammonium salts thereof.

3,953,459

PROCESS FOR THE PREPARATION OF 2,2,6,6-TETRAMETHYL-4-OXOPIPERIDINE

Ivan Orban, Basel; Hanns Lind, Liestal; Heimo Brunetti, Reinach, and Jean Rody, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 21, 1974, Ser. No. 481,921

Claims priority, application Switzerland, June 25, 1973, 9240/73; Apr. 19, 1974, 5438/74; May 22, 1973, 7017/73

Int. Cl.² C07D *211/74*

U.S. Cl. 260—293.89 **37 Claims**

1. Process for the preparation of 2,2,6,6-tetramethyl-4-oxopiperidine from 2,2,4,4,6-pentamethyl-2,3,4,5-tetrahydropyrimidine (acetonine), wherein the acetonine is treated with 0.2 to 12 mol-%, relative to the acetonine starting material, of an acid catalyst, whereby the operation is performed

(a) without water or with less than the equimolar amount of water, relative to the acetonine, and in the presence of acetone and/or diacetone alcohol; or (b) with at least the equimolar amount of water, relative to the acetonine.

3,953,460

ETHYLENE DERIVATIVES

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote; Charon Robin Ganellin, Welwyn Garden City, and Hunter Douglas Prain, Hitchin, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

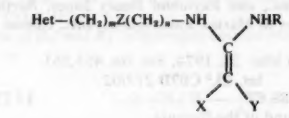
Filed May 9, 1974, Ser. No. 468,617

Claims priority, application United Kingdom, May 17, 1973, 23568/73

Int. Cl.² C07D *213/28*

U.S. Cl. 260—294.8 G 7 Claims

1. A compound of the formula



wherein X and Y, which may be the same or different, are hydrogen, nitro, cyano or SO_2Ar but are not both hydrogen; R is hydrogen, lower alkyl or $Het(CH_2)_mZ(CH_2)_n$; Z is sulphur *m* is 0, 1 or 2 and *n* is 2 or 3, provided that the sum of *m* and *n* is 3 or 4; Het is a pyridine ring which ring is optionally substituted by lower alkyl, hydroxyl, halogen or amino; and Ar is an aryl group such as phenyl optionally substituted by halogen, methyl or amino or a pharmaceutically acceptable acid addition salt thereof.

3,953,461

AMINO DERIVATIVES OF THIAZOLO[5,4-B]PYRIDINE-6-CARBOXYLIC ACIDS AND ESTERS

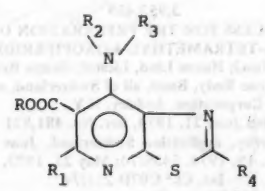
Theodor Denzel, Regensburg, and Hans Hoehn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Mar. 5, 1975, Ser. No. 555,512

Int. Cl.² C07D *213/55*

U.S. Cl. 260—294.8 C 9 Claims

1. A compound of the formula



wherein R, R_1 and R_4 each is hydrogen or lower alkyl, and R_2 and R_3 each is hydrogen, lower alkyl, phenyl or di(lower alkyl)amino-lower alkyl, and physiologically acceptable salts thereof.

3,953,462

IMAGING PROCESS

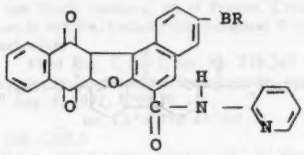
Robert J. Gruber, Pittsford, and Nicholas J. Germano, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1973, Ser. No. 411,596

Int. Cl.² C07D *405/04*

U.S. Cl. 260—295 A 1 Claim

1. 3-bromo-N-2''-pyridyl-8,13-dioxodinaphtho-(2,1-b;$_2$',3'-d)-furan-6-carboxamide which is represented by the formula



3,953,463

2-ARYL-6-TRIFLUOROMETHYL-4-PYRIDYL-CARBINOLAMINE ANTIMALARIALS

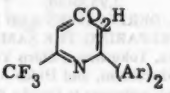
Arthur B. Ash, Detroit; Maurice P. La Montagne, Sterling Heights, and Anica Markovac, Lathrup Village, all of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 448,468, March 6, 1974, Pat. No. 3,886,167. This application Sept. 16, 1974, Ser. No. 506,421

Int. Cl.² C07D *213/26*

U.S. Cl. 260—295 R 4 Claims

1. The compound of the formula



wherein $(Ar)_2$ is a phenyl ring substituted with a trifluoromethyl, chloro, bromo, fluoro or methoxy substituent in the phenyl ring.

3,953,464

CYCLIC SULPHOXIMIDES

Peter Stoss, Wildtal; Gerhard Satzinger, Denzlingen, and Manfred Herrmann, St. Peter, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

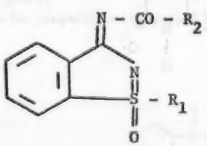
Filed Aug. 9, 1974, Ser. No. 495,985

Claims priority, application Germany, Aug. 11, 1973, 2340784; Mar. 11, 1974, 2411612

Int. Cl.² C07D *275/04*

U.S. Cl. 260—302 F 22 Claims

1. Cyclic sulphoximide of the formula:



wherein R_1 is methyl or phenyl and R_2 is alkyl or alkoxy containing up to 4 carbon atoms, cyclohexoxy, methoxyethoxy, phenoxy, phenyl, benzyl, phenoxymethyl which may be substi-

tuted by chlorine atom, hydroxy group or methoxy, or acetoxyphenyl.

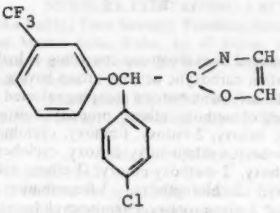
3,953,465

2-[α-(3-TRIFLUOROMETHYLPHENOXYL)-4-CHLOROBENZYL]OXAZOLE AND METHODS FOR PREPARING THE SAME

William A. Bolhofer, Frederick, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 243,480, April 11, 1972, Pat. No. 3,816,446. This application Oct. 26, 1973, Ser. No. 410,130
Int. Cl.² C07D *263/32*
U.S. Cl. 260—307 R 1 Claim

1. A compound of the formula:



and non-toxic, pharmaceutically acceptable salts thereof.

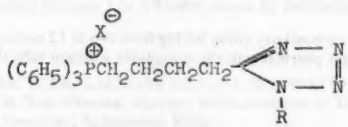
3,953,466

4(TETRAZOL-5-YL)-BUTYLTRIPHENYLPHOSPHONIUM HALIDE COMPOUNDS

Hans-Jurgen E. Hess, Old Lyme; Leonard J. Czuba, New London, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 335,586, Feb. 26, 1973, Pat. No. 3,883,513, which is a continuation-in-part of Ser. No. 177,102, Sept. 1, 1971, abandoned. This application July 25, 1974, Ser. No. 491,784
Int. Cl.² C07D *257/04*
U.S. Cl. 260—308 D 5 Claims

1. A compound of the structure:



wherein R is hydrogen or alkyl having from 1 to 3 carbon atoms; and
X is chlorine, bromine, or iodine.

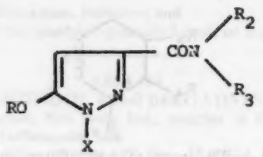
3,953,467

PYRAZOLE DERIVATIVES AND PROCESS FOR PREPARING THE SAME

Hajime Fujimura, Kyoto; Mikio Hori, Gifu; Osamu Ootani, Minokamo; Sachio Ohno, Aichi; Tadashi Kitamikado; Kiyoshi Kato, both of Nagoya, and Mitsuaki Nagasaka, Aichi, all of Japan, assignors to Maruko Seiyaku Co., Ltd., Nagoya, Japan

Filed Apr. 17, 1974, Ser. No. 461,764
Claims priority, application Japan, Apr. 17, 1973, 48-43827
Int. Cl.² C07D *231/22*; A61K *31/415*
U.S. Cl. 260—310 R 14 Claims

1. Pyrazole compounds represented by the formula



wherein R represents an alkyl group of 1 to 4 carbon atoms, X represents a mono- or di-substituted phenyl group wherein the substituents may be the same or different and each represents an alkyl group of 1 to 4 carbon atoms, an alkoxy group of 1 to 4 carbon atoms, a trifluoromethyl group, a nitro group, an amino group or a halogen atom; or a substituted or unsubstituted benzyl group wherein the substituent is a halogen atom, R_2 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms and R_3 represents a hydrogen atom, a hydroxyalkyl group of 1 to 4 carbon atoms, an alkyl group of 1 to 4 carbon atoms or a substituted aminoalkyl group of 1 to 4 carbon atoms.

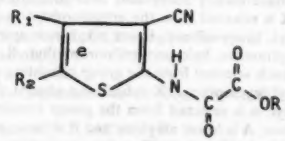
3,953,468

3-CYANO THIOPHEN-2-YL OXAMIC ACID AND DERIVATIVES

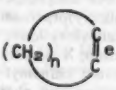
William J. Wechter, and John B. Wright, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 15, 1974, Ser. No. 451,509
Int. Cl.² C07D *333/24*
U.S. Cl. 260—332.2 R 8 Claims

1. A compound of the formula

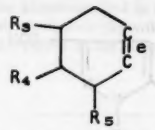


wherein R is selected from the group consisting of hydrogen, alkyl from one to ten carbon atoms, inclusive, phenyl, benzyl, and a pharmaceutically acceptable metal or amine cation; R_1 and R_2 are the same or different and are selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, phenyl, and R_1 and R_2, when joined with the carbon atoms to which they are attached, *e* denoting the common double bond of the thiophene ring and the ring formed when R_1 and R_2 are joined together with the carbon atom to which they are attached, form the following groups:

a. 

where *n* is an integer from three to ten, inclusive;

b.



where R_3, R_4, and R_5 are the same or different and are selected from the group consisting of hydrogen and alkyl from one to four carbon atoms, inclusive; with the proviso that R_3, R_4, and R_5 are each not hydrogen at the same time.

3,953,469

BENZOXOZEPINE CARBOXAMIDES AND DERIVATIVES THEREOF

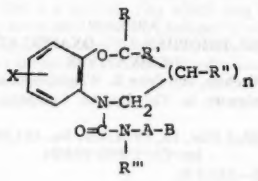
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation of Ser. No. 723,892, April 24, 1968, abandoned, which is a division of Ser. No. 435,677, Feb. 26, 1965, Pat. No. 3,395,150. This application Aug. 31, 1971, Ser. No. 176,750

Int. Cl.[2] C07D *265/36*, *273/00*, *413/12*, *413/14*

U.S. Cl. 260—333 10 Claims

1. A compound selected from the group consisting of bases of the formula:



and pharmaceutically acceptable acid-addition salts thereof, wherein X is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy, lower alkyl mercapto, nitro, di(lower alkyl)amino, halo and trifluoromethyl; R, R′, R″ and R‴, are each selected from the group consisting of hydrogen, lower alkyl, cyclopropyl, X-substituted phenyl, furyl, thienyl and pyridyl; *n* is selected from the group consisting of zero, one and two; A is lower alkylene and B is basic nitrogen-containing radical of less than 12 carbon atoms selected from the group consisting of amino; (lower alkyl)amino; (hydroxy-lower alkyl)amino; di(hydroxy-lower alkyl)amino di(lower alkyl)amino; phenyl (lower alkyl)amino; N-(lower alkyl)phenyl-(lower alkyl)amino; piperidino; (lower alkyl)piperidino; di(lower alkyl)piperidino; (lower alkoxy)piperidino 4-(N-lower alkyl)-piperidyl; homopiperidino; pyrrolidino; (lower alkyl)pyrrolidino; di(lower alkyl)pyrrolidino; (lower alkoxy)-pyrrolidino; morpholino; (lower alkyl)morpholino; di(lower alkyl)morpholino; (lower alkoxy)morpholino; thiamorpholino; (lower alkyl)thiamorpholino; di(lower alkyl)-thiamorpholino; (lower alkoxy)thiamorpholino; piperazino; homopiperazino; (lower alkyl)piperazino; di(lower alkyl)-piperazino; (lower alkoxy)piperazino; hydroxy-lower alkyl-piperazino; lower alkanoyloxy-lower alkyl-piperazino; X-substituted phenylpiperazino; X-substituted phenyl(lower alkyl)-piperazino; X-substituted cinnamyl (lower alkyl)piperazino and N[4]-pyridyl piperazino and pharmaceutically acceptable salts thereof.

3,953,470

SUBSTITUTED PROSTAGLANDIN DERIVATIVES

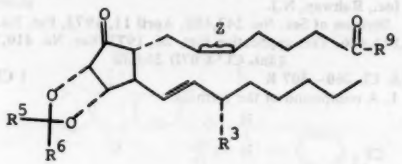
Pierre Crabbe, and Angel Guzman, both of Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 204,681, Dec. 3, 1971, Pat. No. 3,846,475. This application July 11, 1974, Ser. No. 487,504

Int. Cl.[2] C07F *317/44*

U.S. Cl. 260—340.5 14 Claims

1. A compound of the formula:



wherein R^3 is selected from the group consisting of hydroxy or a hydrocarbon carboxylic acyloxy group having from two through 12 carbon atoms or a grouping selected from those consisting of methoxy, ethoxy, propoxy, 2-propoxy, cyclopropoxy, butoxy, 2-butoxy, t-butoxy, cyclobutoxy, pentoxy, 3-pentoxy, cyclopentoxy, hexoxy, cyclohexoxy, methoxy-methoxy, 2-methoxy-ethoxy, 2-ethoxy-ethoxy, 2-aminoethoxy, 2-chloroethoxy, 3-fluorobutoxy, 2-acetoxyethoxy, 3-nitropropoxy, 3-aminocyclobutoxy, 4-hexylcyclohexoxy, 2-phenoxyethoxy, phenoxy, tolyloxy, chlorophenoxy, m,m′-dimethylphenoxy, p-nitrophenoxy, β-chloropropoxy, p-aminophenoxy, tetrahydrofuran-2′-yloxy and tetrahydropyran-2′-yloxy; Z represents a saturated carbon-carbon linkage or a cis carbon=carbon double bond; R^5 and R^6 are independently selected from the group of hydrogen, lower alkyl and aryl groups having a total of up to 16 carbon atoms and containing one aromatic ring having up to 10 carbon atoms optionally substituted with one or more pharmaceutically acceptable functional groups selected from the group of hydroxy, lower alkyl hydrolyzable ester, lower alkyl or halo, or R^5 and R^6 together with the carbon atom to which they are joined from a cycloalkyl group having 5 or 6 ring carbon atoms; R^9 is hydroxy; or the group

is a carboalkoxy group having from two to 12 carbon atoms; and pharmaceutically acceptable addition salts thereof.

3,953,471

KETALS OF 4-ACETYL-3,3,5,5-TETRAMETHYLCYCLOHEXANONE

Bernard Pierre Corbier, and Paul Jose Teisseire, both of Grasse, France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

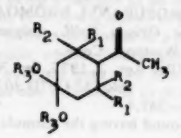
Division of Ser. No. 110,652, Jan. 28, 1971, Pat. No. 3,875,241, which is a continuation-in-part of Ser. No. 585,259, Oct. 10, 1966, Pat. No. 3,578,715. This application Feb. 3, 1975, Ser. No. 546,532

Claims priority, application Switzerland, Oct. 14, 1965, 14216/65

Int. Cl.[2] C07C *49/26*; C07D *317/12*

U.S. Cl. 260—340.9 4 Claims

1. Compounds having the formula



V

wherein R_1 and R_2 represent lower alkyl and the symbols R_3 each represent lower alkyl or, taken together, a lower alkylene group.

3,953,472

METHOD FOR SEPARATING LACTONES FROM A MIXTURE CONTAINING LACTONES

Yutaka Fujita; Toru Sawaki; Tadahisa Sasano, all of Iwakuni, and Masao Sada, Kobe, all of Japan, assignors to Teijin Limited and Sumitomo Chemical Company, Limited, both of Osaka, Japan

Filed Mar. 15, 1974, Ser. No. 451,564

Claims priority, application Japan, Mar. 17, 1973, 48-30510

Int. Cl.² C07D *307/12*

U.S. Cl. 260—343 **12 Claims**

1. A method for separating lactones from a mixture comprising (a) at least one member selected from the group consisting of saturated aliphatic hydroxy acids wherein the OH group and the COOH group are bonded through 3 or 4 carbon atoms, lactones derived therefrom, lower polymers of said hydroxy acids and/or said lactones and esters of said hydroxy acids and/or said lactones, and (b) at least one member selected from the group consisting of saturated aliphatic hydroxy acids wherein the OH group and the COOH group are bonded through 5 carbon atoms, lactones derived therefrom, lower polymers of said hydroxy acids and/or said lactones and esters of said hydroxy acids and/or said lactones, which comprises

treating said mixture in the presence of one or more saturated monovalent or bivalent aliphatic or alicyclic alcohols

under a pressure of from 0.1 to 500 mm Hg absolute

at a temperature of from 180° to 340°C to remove the lactones derived from the saturated aliphatic hydroxy acids wherein the OH group and the COOH group are bonded through 3 or 4 carbon atoms by distillation.

3,953,473

TRICYCLIC LACTONE GLYCOL SULFONATES

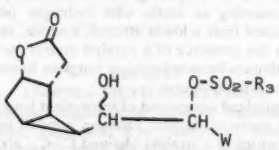
Verlan H. Van Rheenen, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 374,348, June 28, 1973, abandoned. This application May 8, 1975, Ser. No. 575,527

Int. Cl.² C07D *307/93*

U.S. Cl. 260—343.3 R **10 Claims**

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof;

wherein R_3 is alkyl of one to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one or two halo, or alkyl of one to 4 carbon atoms, inclusive; and

wherein W is 1-pentyl, 1-pent-cis-2-enyl, or 1-pent-2-ynyl.

3,953,474

ANTIBIOTIC A204I DERIVATIVES

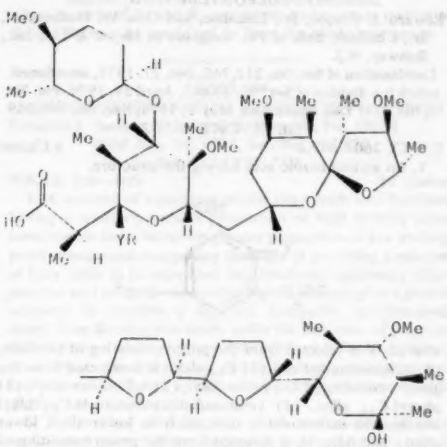
Robert L. Hamill, New Ross, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 524,178, Nov. 15, 1974, Pat. No. 3,907,832. This application Apr. 3, 1975, Ser. No. 564,934

Int. Cl.² C07D *309/22*

U.S. Cl. 260—345.7 **3 Claims**

1. The A204I derivative of the formula:



wherein:

Y represents O; and

R represents

C_1–C_4-alkoxy C_2–C_5-alkyl,

C_1–C_4-alkoxycarbonyl-C_2–C_6-alkyl,

amino-C_2–C_5-alkyl,

mercapto-C_2–C_5-alkyl,

C_2–C_5 hydroxyalkyl, 2,3-dehydroxypropyl

C_2–C_5 haloalkyl, or

$(R')_m$-phenyl$(CH_2)_n$-,

wherein R′ represents C_1–C_4-alkyl, C_1–C_4-alkoxy, or hydroxy;

m represents 0–2; and

n represents 0–3;

or a physiologically acceptable cationic salt thereof.

3,953,475

POLYBUTENE COMPOSITION CONTAINING HALO-CARBONYL ADDITIVES

Imre Puskas, Glen Ellyn, and John A. Cengel, Wheaton, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed May 10, 1973, Ser. No. 358,958

Int. Cl.² C07D *307/60*

U.S. Cl. 260—346.8 R **4 Claims**

1. A method of preparing polybutenylsuccinic anhydride which comprises reacting at a temperature in the range of 150°–300°C in the proportions of from 1.0 to 1.5 moles maleic anhydride per mole of 300–3000 M_n polybutene in the composition comprising said polybutene and based on the weight thereof as additive from 5 to 200 ppm of an alpha-bromo dialkyl ketone having in addition to the keto-carbonyl carbon

atom up to a total of twenty carbon atoms, alpha-dibromo-substituted alkyl diketone wherein its two keto-carbonyl carbon atoms are in a chain of from 4 to 22 carbon atoms and each bromo- substituent is on a chain carbon atom adjacent to a keto-carbonyl carbon atom, or alpha-bromo aceto-phenone or napthone, or C_1–C_{10} dialkyl acetal of alpha-bromo acetaldehyde which additive has a normal boiling point in the range of from 40°C up to 225°C.

3,953,476

3-AMINO-5-SULFONYLBENZOIC ACIDS

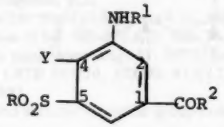
Edward J. Cragoe, Jr., Lansdale, and Otto W. Woltersdorf, Jr., Chalfont, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 212,745, Dec. 27, 1971, abandoned, which is a division of Ser. No. 33,061, April 29, 1970, Pat. No. 3,780,027. This application May 1, 1974, Ser. No. 465,949

Int. Cl.² C07D *307/52*

U.S. Cl. 260—347.2 6 Claims

1. An aminobenzoic acid having the structure:



wherein Y is selected from the group consisting of (1) halo, (2) trifluoromethyl and (3) C_{1-3} alkyl; R is selected from the group consisting of (1) lower alkyl; (2) halo-lower alkyl, (3) phenyl-C_{1-3} alkyl, (4) (monosubstituted-phenyl)-C_{1-3} alkyl wherein the substituent is selected from lower alkyl, lower alkoxy and halo; R_1 is selected from the group consisting of (1) phenyl-C_{1-3} alkyl, (2) (monosubstitutedphenyl)-C_{1-3} alkyl wherein the substituent is selected from halo, C_{1-3} alkyl and C_{1-3} alkoxy, (3) naphthyl-C_{1-3} alkyl, (4) furyl-C_{1-3} alkyl, (5) carboxyfuryl-C_{1-3} alkyl, (6) thienyl-C_{1-3} alkyl, (7) halo-C_{1-3} alkyl, (8) hydroxy-C_{1-3} alkyl, (9) di-C_{1-3} alkylamino-C_{1-3} alkyl, and (10) C_{3-6} cycloalkyl-C_{1-3} alkyl and R_2 is selected from the group consisting of (1) hydroxy and its pharmaceutically acceptable salts, and (2) OR^3 wherein R^3 is C_{1-5} alkyl and di-C_{1-3} alkylamino-C_{1-3} alkyl.

3,953,477

N-TETRAHYDROFURFURYL-3,5-DIMETHYLBENZAMIDE

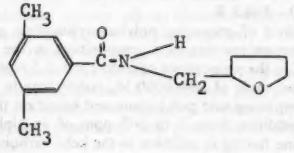
Don R. Baker, Orinda; Francis H. Walker, Mill Valley, and Peter E. Letchworth, Cupertino, all of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 417,306, Nov. 19, 1973, abandoned. This application Dec. 24, 1974, Ser. No. 536,064

Int. Cl.² C07D *307/14*

U.S. Cl. 260—347.3 1 Claim

1. The compound



3,953,478

TETRAHYDROFURANYL BROMOACETATES BIOCIDES

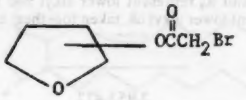
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 2, 1975, Ser. No. 564,517

Int. Cl.² C07D *307/24*

U.S. Cl. 260—347.4 4 Claims

1. A compound having the formula



3,953,479

DIGLYCIDYL ESTERS OF C_{21}-CYCLOALIPHATIC DICARBOXYLIC ACID

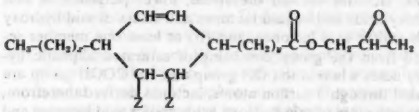
Carlton G. Force, Mount Pleasant, and Benjamin F. Ward, Isle of Palms, both of S.C., assignors to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 393,959, Sept. 4, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,505

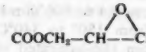
Int. Cl.² C07D *303/44*

U.S. Cl. 260—348 A 1 Claim

1. A compound having the structural formula



wherein x and y are integers from 3 to 9, x and y together equal 12, and Z is a member of the group consisting essentially of



and hydrogen with one Z of each moiety.

3,953,480

EPOXIDATION OF OLEFINS BY HYDROGEN PEROXIDE

Serge Delavarenne, Francheville-le-Haut; Francis Weiss, Rethondes, and Jean-Pierre Schirmann, Brignais, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Sept. 30, 1974, Ser. No. 510,461

Claims priority, application France, Oct. 2, 1973, 73.35113

Int. Cl.² C07D *301/12*

U.S. Cl. 260—348.5 L 10 Claims

1. A method for preparing an oxirane compound which comprises reacting an olefin with hydrogen peroxide in a solvent selected from a lower alkanol, a nitrile, an amide, and an ether, in the presence of a catalyst system including:

a. molybdenum hexacarbonyl or tungsten hexacarbonyl, or a mixture thereof; and

b. an organolead compound of tetravalent lead having from one to three of its four valences bonded to an organic group which is a straight-chained C_1–C_{12} alkyl radical, a C_3–C_{12} branched or cyclic alkyl radical, a C_3–C_{11} straight-chained alkylene radical, or a C_6–C_{12} aryl radical, and having the remainder of its four valences bonded to at least one anionic group which is a hydroxyl group or a group which is conventible to a hydroxyl or hydroperoxyl group in the presence of aqueous hydrogen peroxide, said

convertible group being a halogen or an anion of a mineral or organic acid, or a C_1–C_{18} alkoxy or phenoxy group or an oxide anion formed by the loss of a proton from an organolead hydroxide, wherein said organic groups can be identical to or different from each other and wherein said anionic groups can be identical to or different from each other.

3,953,481

DIACYLIUM COMPLEXES OF TETRAHALOTEREPHTHALIC ACID

James O. Knobloch, Naperville, Ill., and Fausto Ramirez, Goshen, Va., assignors to Standard Oil Company, Chicago, Ill.

Filed June 10, 1974, Ser. No. 477,668
Int. Cl.² C07C *161/00*
U.S. Cl. 260—350 R 7 Claims

1. A diacylium sulfate complex of a tetrahaloterephthalic acid.

4. The method of producing the diacylium sulfate complex of claim 1, which comprises dispersing a tetrahaloterephthalic acid in substantially pure sulfur trioxide wherein at least two moles of sulfur trioxide are present per mole of tetrahaloterephthalic acid.

3,953,482

PROCESS FOR PRODUCING QUINONES

Junichiro Sugano; Yasuhisa Kuriyama; Yukio Ishiuchi, and Yoshitugu Minamikawa, all of Yokkaichi, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Aug. 9, 1973, Ser. No. 387,229
Claims priority, application Japan, Aug. 16, 1972, 47-81472
Int. Cl.² C07C *49/66*, *49/68*
U.S. Cl. 260—396 R 13 Claims

1. A process for producing anthraquinones or alkyl-substituted naphthoquinones, which comprises reacting in the liquid phase at a temperature of from 0° to 100°C an anthracene or an alkylnaphthalene with hydrogen peroxide in the presence of 5–35 moles of hydrogen chloride per mole of the anthracene or alkylnaphthalene, the total amount of water in said reaction mixture before reaction being not more than 25% by weight based on the total weight of the reaction mixture;

wherein said anthracene is anthracene or an anthracene substituted by 1 to 8 alkyl groups each of which contains not more than 10 carbon atoms at positions other than the 9- and 10-positions of said anthracene; and

wherein said alkylnaphthalene is an alkylnaphthalene substituted by an alkyl group which contains not more than 10 carbon atoms only at the 2-position, or an alkylnaphthalene substituted by alkyl groups, each of which contains not more than 10 carbon atoms, in the 2-position and in at least one of the 3-, 5-, 6-, 7- or 8-positions.

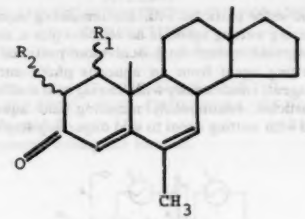
3,953,483

17-NOR-6-METHYL-STEROIDS

Kentaro Hiraga, Nagaokakyo; Kouichi Yoshioka, Ukyoku; Glichi Goto, Toyonaka; Ryo Nakayama, Kawanishi, and Michio Masuoka, Miki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed June 13, 1974, Ser. No. 479,676
Claims priority, application Japan, June 16, 1973, 48-68107
Int. Cl.² C07J *1/00*
U.S. Cl. 260—397.3 4 Claims

1. A compound of the formula



wherein each of R_1 and R_2 represents hydrogen or methyl or R_1 and R_2 may be combined to form the methylene group.

3,953,484

METHOD OF SEPARATING FATTY ACID FRACTIONS

Leonard L. Sutker, 912 Fernhill, Glenside, Pa. 19038

Filed Aug. 14, 1974, Ser. No. 496,870
Int. Cl.² C11C *1/08*
U.S. Cl. 260—419 12 Claims

1. A method of separating mixed fatty acids into fractions having a relatively greater proportion of high melting point constituents and a relatively greater proportion of low melting point constituents comprising the steps of providing a mixture of fatty acids to be separated into fractions, vigorously whipping the said mixture and continuing the whipping for a period adequate to produce a liquified, pumpable, gas-entrained slurry, then filtering said slurry under the influence of pressure different from ambient pressure to produce a filtrate having a relatively greater proportion of low melting constituents and a solid fraction having a relatively greater proportion of high melting constituents.

5. The method of claim 1 in which said mixture of fatty acids is a mixture of tallow fatty acids and the filtrate is red oil and the solid fraction is commercial grade stearic acid.

7. The method of claim 1 in which said whipping takes place in the presence of air to incorporate air into the mixture whereby the slurry produced is an aerated slurry.

3,953,485

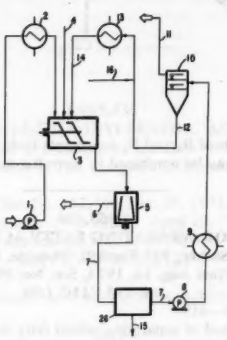
CONTINUOUS PROCESS FOR THE SEPARATION OF MIXTURES OF FATTY SUBSTANCES OF DIFFERENT MELTING POINTS

Werner Stein, Erkrath-Unterback, and Helmüt Hartmann, Langenfeld, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Division of Ser. No. 300,895, Oct. 26, 1972, Pat. No. 3,870,735. This application Nov. 7, 1974, Ser. No. 521,915
Claims priority, application Germany, Nov. 11, 1971, 2155988
Int. Cl.² C09F *5/10*; C11B *3/00*
U.S. Cl. 260—428 9 Claims

1. A continuous process for the separation of mixtures of fatty acid esters into fatty acid ester mixtures of different melting points by the steps of continuously dispersing said mixture of fatty acid esters consisting of an oily phase and a solid phase in a recycling aqueous wetting agent solution at a temperature whereby a dispersion of liquid and solid fatty acid ester particles is obtained, continuously separating said dispersion into two phases of different specific gravities, a lighter phase consisting substantially of liquid fatty acid ester fractions and a heavier phase consisting substantially of solid fatty acid ester particles dispersed in said aqueous wetting agent solution, continuously withdrawing said liquid fatty acid ester fractions, continuously separating said solid fatty acid ester particles from 10% to 70% by weight of said aqueous wetting agent solution, continuously withdrawing said separated aqueous wetting agent solution, continuously melting said solid

fatty acid ester particles with the remaining aqueous phase and adhering wetting agent, in an aqueous phase, continuously separating said melted fatty acid ester particles containing little wetting agent from an aqueous phase enriched with wetting agent, continuously withdrawing said melted fatty acid ester particles, continuously recycling said aqueous phase enriched with wetting agent to said dispersing step and continuously replacing said withdrawn part of said recycling aqueous wetting agent solution with a fresh aqueous solution whereby the concentration of said recycling aqueous wetting agent solution is maintained substantially constant at said dispersing step.



9. The process of claim 1 wherein said mixture of fatty acid esters is a mixture of triglycerides.

3,953,486
MANUFACTURE OF LEAD STYPHNATE

Kenneth John Holloway, Sandringham; John Michael Jenkins, Chingford, and George William Charles Taylor, Waltham Abbey, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Feb. 6, 1973, Ser. No. 330,083

Claims priority, application United Kingdom, June 9, 1972, 27052/72

Int. Cl. C07f 7/24

U.S. Cl. 260—435 A **14 Claims**

1. A process for the preparation of α normal lead styphnate comprising reacting at an elevated temperature an aqueous solution containing lead nitrate with a solution containing magnesium styphnate in the presence of a mineral acid present in the range about 1 to about 15 grams of mineral acid to 1 liter of the solution containing the magnesium styphnate.

3,953,487
PROCESS FOR PREPARING HYDROPHOBIC SILICON DIOXIDE

Günther Kratel, Durach-Bochen; Günter Stohr, Kempten; Georg Vogt, Kempten, St. Mang, and Hans Kaiser, Lauben, Allgau, all of Germany, assignors to Elektroschmelzwerk Kempten GmbH, Munich, Germany

Filed Aug. 23, 1974, Ser. No. 500,203

Claims priority, application Germany, Sept. 3, 1973, 2344388

Int. Cl.² C07F 7/04, 7/08, 7/10, 7/18

U.S. Cl. 260—448.2 E **5 Claims**

1. A process for preparing hydrophobic SiO_2 which comprises the steps of:

a. reacting solid SiO_2 of finest particle size with an organosilicon compound having the general formula

$$(R_3Si)_aZ$$

wherein R represents the same or different monovalent hydrocarbon radicals, Z represents a member of the group consisting of halogen, hydrogen and a radical of the formula —OH, —OR′, —NR′X, —ONR′$_2$, —SR′, —OOCR′, —O—, —N(X)—, and —S—, wherein R′ is alkyl with 1 to 4 carbon atoms, X is hydrogen or the same radicals as R, and a is an integer from 1 to 2, while subjecting the reaction mixture to a mechanical impact treatment which will at the same time result in a comminution of the SiO_2 particles as well as of aggregates of the same, whereby the SiO_2 contains organosilicon groups bonded to it after the reaction;

b. while incorporating into the reaction mixture, in addition to the water adsorbed to the SiO_2, an amount of from 0.3% to 3% by weight of water, calculated on the weight of the SiO_2.

3,953,488
METHOD FOR PREPARING ALIPHATIC AND CYCLOALIPHATIC ISOTHIOCYANATES

Peter H. Scott, Sudbury, Mass., and Ehrenfried H. Kober, Aschau near Kraiburg, Germany, assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 2, 1971, Ser. No. 168,439

Int. Cl.² C07C 161/04

U.S. Cl. 260—454 **10 Claims**

1. A method for preparing aliphatic isothiocyanates comprising reacting:

a. a nitroalkane or nitrocycloalkane containing from 1 to 22 carbon atoms with

b. a sulfur-containing carbon compound selected from the group consisting of:

1. carbonyl sulfide,

2. carbon disulfide, and

3. mixtures of carbonyl sulfide and carbon disulfide

in the presence of

c. a carbonyl of a metal selected from the group consisting of iron, nickel, cobalt, vanadium, niobium, tantalum, chromium, molybdenum and tungsten, said reaction being carried out at a temperature of from about 20° to about 250°C. and employing from about 1 to about 100 moles of said sulfur containing carbon compound per mole of nitro group in said nitroalkane or nitrocycloalkane and from about 0.0001 to about 1 mole of said carbonyl of a metal per mole of nitro group in said nitroalkane or said nitrocycloalkane.

3,953,489
ALKYL 2-NITRO-5-(2,4-DICHLOROPHENOXY)-THIOBENZOATES

Saburo Tamura, Tokyo; Tetsuo Takematsu, Utsunomiya, and Hisae Haruta, Ibaraki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

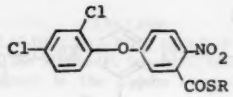
Filed Jan. 17, 1975, Ser. No. 542,052

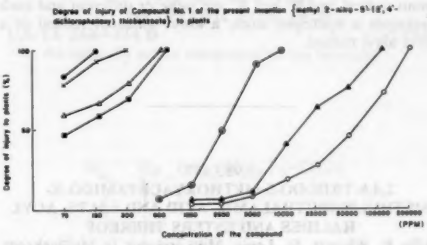
Claims priority, application Japan, Apr. 10, 1974, 49-41129; June 10, 1974, 49-66276

Int. Cl.² C07C 153/07

U.S. Cl. 260—455 R **5 Claims**

1. A compound of the formula:





wherein R is lower alkyl.

3,953,490

PREPARATION OF (3-TRIFLUOROMETHYLPHENOXY)(4-CHLOROPHENYL)ACETONITRILE

Richard F. Shuman, Westfield, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 271,444, July 13, 1972, abandoned. This application Nov. 12, 1974, Ser. No. 523,102

Int. Cl.² C07C *121/66*

U.S. Cl. 260—465 F **3 Claims**

1. A process for preparing (3-trifluoromethylphenoxy)(4-chlorophenyl)acetonitrile which comprises treating 4-chlorophenyl-α-haloacetonitrile with trifluoromethylphenol in the presence of a base.

3,953,491

PHENYL ESTERS OF 4-BENZOYLOXYBENZOIC ACID

Ralf Steinstrasser, and Georg Weber, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

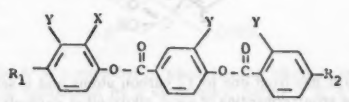
Division of Ser. No. 386,979, Aug. 9, 1973. This application Dec. 18, 1974, Ser. No. 533,823

Claims priority, application Germany, Aug. 19, 1972, 2240864

Int. Cl.² C07C *69/90, 121/64, 121/75*

U.S. Cl. 260—465 D **8 Claims**

1. A nematic compound of the formula:



wherein R_1 and R_2 are each alkyl, alkoxyalkyl, alkoxy or alkoxyalkoxy of up to 10 carbon atoms; X is CN or NO_2; and Y is H or X.

3,953,492

ANTHELMINTIC SUBSTITUTED SULFONAMIDE DERIVATIVES

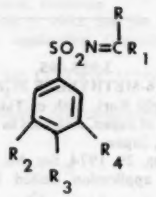
Helmut H. Mrozik, Matawan, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 27, 1975, Ser. No. 562,712

Int. Cl.² C07C *143/80*; C07D *211/54, 295/08*

U.S. Cl. 260—465 E **21 Claims**

1. A compound having the formula:



wherein R is hydrogen or loweralkyl; R_1 is amino or mono or disubstituted amino wherein the substituents are independently selected from loweralkyl, carboxymethylene and phenyl; or loweralkoxy provided that when one of the amino substituents is methyl the other substituent must be other than methyl; R_2 is halo, nitro or perfluoroloweralkyl; R_3 is hydrogen or amino; and R_4 is R_2 or cyano.

3,953,493

SUBSTITUTED SULFONAMIDE DERIVATIVES AS ANTHELMINTIC AGENTS

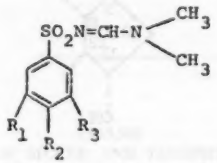
William J. A. Vanden Heuvel, Princeton, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 27, 1975, Ser. No. 562,713

Int. Cl.² C07C *143/80*

U.S. Cl. 260—465 E **6 Claims**

1. A compound having the formula:



wherein

R_1 is halo, nitro or trifluoromethyl;

R_2 is hydrogen or amino; and

R_3 is cyano or R_1.

3,953,494

REACTIONS INVOLVING CARBON TETRAHALIDES AND α-METHYL KETONES OR KETONES HAVING α,α'-HYDROGENS

Cal Yale Meyers, and Walter Sidney Matthews, III, both of Carbondale, Ill., assignors to Southern Illinois University Foundation, Carbondale, Ill.

Filed Dec. 14, 1970, Ser. No. 98,078

Int. Cl.² C07C *51/28, 67/42*

U.S. Cl. 260—468 R **24 Claims**

1. A process for preparing carboxylic acids and esters from α-methyl ketones or ketones having α and α' hydrogens which comprises the steps of:

reacting a substrate selected from the group consisting of α-methyl ketones and ketones having α and α' hydrogens with a carbon tetrahalide represented by the formula

$CBr_mCl_nF_p$ where m and n are integers between 0 and 4 inclusive, p is an integer between 0 and 2 inclusive and $m+n+p=4$, in the presence of a strong base selected from the group consisting of an alkali metal hydroxide, an alkali metal alkoxide, and aluminum alkoxide to form a halogenated intermediate and a dihalocarbene;

reacting said halogenated intermediate with the base; and

separating the carboxylic acid or ester product from the reaction mixture.

3,953,495

16-METHYLENE PGE_2

Masaki Hayashi; Seiji Kori, both of Takatsuki, and Hajimu Miyake, Suita, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

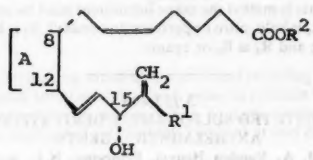
Filed Aug. 29, 1974, Ser. No. 501,548

Claims priority, application United Kingdom, Aug. 31, 1973, 41124/73

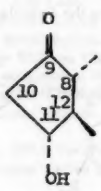
Int. Cl.² C07C *61/38, 64/74*

U.S. Cl. 260—468 D **4 Claims**

1. A compound of the formula:



wherein A represents a grouping of the formula:



R^1 represents a hydrogen atom or a straight- or branched-chain aliphatic hydrocarbon group containing from 1 to 6 carbon atoms, and R^2 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms and cyclodextrin clathrates thereof and, when R^2 represents a hydrogen atom, non-toxic salts thereof.

3,953,496

BIS(BENZAMIDO)-BENZOIC ACID DERIVATIVES

Takashi Mori, Tama; Sakae Takaku, Ageo; Yoshiyuki Osugi, Kodaira; Takashi Matsuno, Tokyo, and Shogo Tomizawa, Tama, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

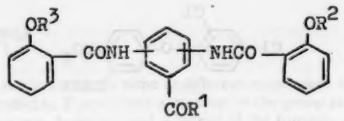
Filed Mar. 13, 1974, Ser. No. 451,003

Claims priority, application Japan, Mar. 27, 1973, 48-34152; Feb. 20, 1974, 49-19407

Int. Cl.² C07C *103/78*

U.S. Cl. 260—471 R **28 Claims**

1. A bis(benzamido)-benzoic acid derivative represented by the formula



wherein R^1 is a hydroxyl radical, a lower alkoxy radical or an amino radical and R^2 and R^3 are same or different and each represents a hydrogen atom, a lower alkanoyl radical or a lower alkyl radical.

3,953,497

2,4,6-TRIIODO-5-METHOXYACETAMIDO-N-METHYLISOPHTHALAMIC ACID AND SALTS, ACYL HALIDES AND ESTERS THEREOF

Philip E. Wiegert, St. Louis, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed July 29, 1974, Ser. No. 492,568

Int. Cl.² C07C *103/76*

U.S. Cl. 260—471 R **7 Claims**

1. A compound selected from the group consisting of 2,4,6-triiodo-5-methoxyacetamido-N-methylisophthalamic acid, the ammonium salt thereof, salts thereof with pharmaceutically acceptable cations, lower alkyl esters thereof, and the acyl halide thereof.

3,953,498

DIESTERS AND DIACIDS OF PHENANTHRENE

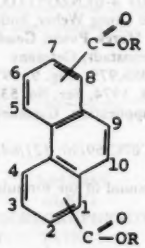
Robert J. Hartle, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 89,124, Nov. 12, 1970, abandoned, which is a continuation-in-part of Ser. No. 635,997, May 4, 1967, abandoned. This application Nov. 13, 1974, Ser. No. 523,355

Int. Cl.² C07C *63/46, 69/76*

U.S. Cl. 260—475 FR **9 Claims**

1. A phenanthrene diester selected from the group consisting of 1,8-, 2,7-, 3,6- and 2,5-phenanthrene diesters, said diester having the formula:



wherein R has from one to 12 carbon atoms and is selected from the group consisting of alkyl, alkoxyalkyl, cycloalkyl and aralkyl.

7. A phenanthrenedicarboxylic acid selected from the group consisting of 1,8-, 2,7-, 3,6- and 2,5-phenanthrenedicarboxylic acids.

3,953,499

8,12-DIALKYL-PGE, AND PGF,

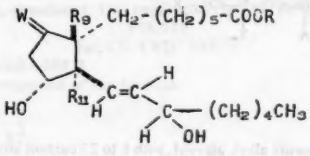
John E. Pike, and William P. Schneider, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 313,368, Dec. 8, 1972, Pat. No. 3,888,919, which is a division of Ser. No. 123,370, March 11, 1971, abandoned, which is a continuation-in-part of Ser. No. 648,992, June 26, 1967, abandoned. This application June 14, 1974, Ser. No. 479,238

Int. Cl.² C07C *61/36, 69/79*

U.S. Cl. 260—514 D 7 Claims

1. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein R is hydrogen or alkyl of 1 to 4 carbon atoms, inclusive, wherein W is

or 0=, and wherein R_9 and R_{11} are both alkyl of one to 4 carbon atoms, inclusive.

3,953,500

BENZALICYCLIC CARBOXYLIC ACID DERIVATIVE

Shunsaku Noguchi, Osaka; Tetsuya Aono, Kyoto; Yoshiaki Araki, Osaka, and Kiyohisa Kawai, Kyoto, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

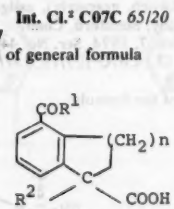
Filed Aug. 12, 1974, Ser. No. 496,855

Claims priority, application Japan, Aug. 11, 1973, 48-90274; Sept. 1, 1973, 48-98371; Sept. 13, 1973, 48-103602; Sept. 13, 1973, 48-103603; Sept. 13, 1973, 48-103604; Sept. 13, 1973, 48-103606; Oct. 31, 1973, 48-122490; May 7, 1974, 49-51034; May 24, 1974, 49-59017; May 3, 1974, 49-62300

Int. Cl.² C07C *65/20*

U.S. Cl. 260—517 20 Claims

1. A compound of general formula



wherein R^1 is a naphthyl or phenyl group which is unsubstituted or substituted by a lower alkyl having 1 to 4 carbon atoms, a lower alkoxy having 1 to 4 carbon atoms, a halogen, a mono- or di-alkylamino having 1 to 3 carbon atoms, acetylamino, propionylamino, acetyloxy or propionyloxy; R^2 is hydrogen or a lower alkyl group having 1 to 4 carbon atoms and n is 1 or 2; or an alkyl ester whose alkyl moiety has 1 to 6 carbon atoms, phenyl ester, benzyl ester, or pharmaceutically acceptable salt thereof at the carboxyl function thereof.

3,953,501

TRIIODOISOPHTHALIC ACID MONOAMINO ACID AMIDES

Erich Klieger; Wolfgang Beich, and Eberhard Schroder, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

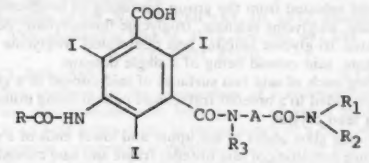
Filed Feb. 9, 1973, Ser. No. 331,110

Claims priority, application Germany, Feb. 16, 1972, 2207950

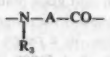
Int. Cl.² C07C *101/68*

U.S. Cl. 260—518 A 11 Claims

1. A triiodoisophthalic acid monoamino acid amide of the formula



wherein



is divalent amino lower alkanoyl derived from a naturally occurring amino acid;

R is alkyl, hydroxyalkyl or alkoxyalkyl of 1–6 carbon atoms;

R_1 and R_2 are each hydrogen, alkyl of 1–6 carbon atoms or hydroxyalkyl of 2–6 carbon atoms

and the physiologically acceptable salts thereof.

3,953,502

RECOVERY OF SILVER AND TEREPHTHALIC ACID COMPONENTS FROM LIGHT SENSITIVE FILM MATERIAL

W. Martin Fassell, Newport Beach, and Donald W. Bridges, Irvine, both of Calif., assignors to Barber-Colman Company, Rockford, Ill.

Filed May 1, 1974, Ser. No. 466,015

Int. Cl.³ C07C *51/42;* C01G *5/00*

U.S. Cl. 260—525 16 Claims

1. A process for the treatment of a polyester formed of terephthalic acid for the recovery of terephthalic acid and silver when present therewith as a light sensitive compound comprising subjecting the polyester to at least partial wet oxidation at elevated pressure and a temperature of at least 325°F in an aqueous alkaline medium having a pH of at least 9 and into which an oxygen containing gas is introduced in an amount to provide at least partial oxidation of the organics present whereby any silver component present remains in the solid phase and the terephthalic acid component is contained in the liquid phase in a dissolved state, separating any solid phase from the liquid phase, acidifying the liquid phase to precipitate the terephthalic acid component, and then separating the terephthalic acid component from the remainder.

3,953,503

METHOD OF MANUFACTURING TRIGLYCINE SERIES FERROELECTRIC CRYSTALS

Yoshio Furuhata, Kodaira; Yasuo Kato, and Zenmon Abe, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 800,637, Feb. 19, 1969, abandoned. This application Feb. 2, 1973, Ser. No. 329,193
Claims priority, application Japan, Feb. 21, 1968, 43-10530; Feb. 21, 1968, 43-10531
Int. Cl.² C07C *101/06*
U.S. Cl. 260—534 S 14 Claims

1. A method of manufacturing a tri-glycine series ferroelectric crystal comprising the steps of:

cutting out a cuboid elongated in [100] direction having surfaces of (001) and (010) and two surfaces which are opposite to each other and which are perpendicular to said surfaces of (001) and (010), from a (001) region of a b-plate crystal of a tri-glycine series ferroelectric material selected from the group consisting of tri-glycine sulfate, tri-glycine selenate, tri-glycine fluoberyllate, deuterated tri-glycine sulfate, and deuterated tri-glycine selenate, said cuboid being of a single domain;

fitting each of said two surfaces of said cuboid in a groove provided to a breeder frame, said cuboid being utilized as a seed crystal;

bonding glass plates to the upper and lower ends of a structure consisting of said breeder frame and said cuboid seed crystal so that said seed crystal is capable of growing freely only on said (001) surfaces;

submerging said seed crystal mounted on said breeder frame together with said glass plates in a breeding mother liquid at a temperature in a range of from 25° to 90° C. for tri-glycine sulfate, in a range from 25° to 90° C. for tri-glycine selenate, in a range from 25° to 90° C. for tri-glycine fluoberyllate, in a range from 25° to 90° C. for deuterated tri-glycine sulfate and in a range from 25° to 80° C. for deuterated tri-glycine selenate;

subjecting said cut out seed crystal to a DC electric field before submerging said seed crystal in said breeding mother liquid when the starting temperature of growth is higher than the Curie temperature of the crystal to be grown; and

cooling at a rate not higher than 0.5° C./ day said breeding mother liquid together with said structure and said glass plates so that said seed crystals grows in directions perpendicular to said (001) surfaces.

3,953,504

RACEMIZATION OF OPTICALLY ACTIVE TARTARIC ACID

Minoru Saotome, Koriyama; Yoshikazu Yamamoto, Ikeda; Nobuo Watani, Kyoto, and Ryuichi Kayama, Koriyama, all of Japan, assignors to Nippon Peroxide Co., Ltd., Tokyo and Showa Chemical Co., Ltd., both of, Japan

Filed Mar. 18, 1975, Ser. No. 559,416
Int. Cl.² C07C *59/14*
U.S. Cl. 260—536 7 Claims

1. A process for the racemization of optically active tartaric acid or a salt thereof, which comprises:

mixing meso-tartaric acid or a salt thereof with a solution of an optically active enantiomer of tartaric acid or a salt thereof in a molar ratio of 0.2 – 0.5, and thereafter heating the mixture.

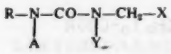
3,953,505

CARBAMIDE-FORMALDEHYDE CONDENSATION PRODUCTS, THEIR MANUFACTURE AND USE

Luzius Schibler, Riehen, and Jurg Merz, Therwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 26, 1973, Ser. No. 344,670
Claims priority, application Switzerland, Mar. 28, 1972, 4632/72; Dec. 22, 1972, 18728/72
Int. Cl.² C07C *127/15*
U.S. Cl. 260—553 R 6 Claims

1. An urea-formaldehyde condensation product having the formula



wherein

R represents alkyl, alkenyl, with 6 to 22 carbon atoms in the alkyl or alkenyl moiety,

A represents hydrogen or alkyl with 1 to 4 carbon atoms,

Y represents hydrogen, $-CH_2O-Q$, wherein Q is hydrogen or alkyl with 1 to 4 carbon atoms, or $-CH_2-X'$, and

X and X', independently of the other, represent a monoalkylene or polyalkylene glycol radical, bonded via an oxygen atom, and having an average molecular weight of at most 2,000 and 2 to 4 carbon atoms per alkylene unit.

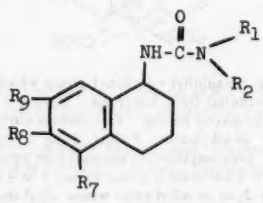
3,953,506

UREIDOTETRALIN COMPOUNDS

Larry Dean Spicer, Princeton; Joseph Michael Pensack, Trenton; Robert Daniel Wilbur, Titusville, all of N.J., and Gary Michael Demkovich, deceased, late of Cranbury, N.J. (by Ruth Ellen Demkovich, executrix), assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 7, 1974, Ser. No. 440,625
Int. Cl.² C07C *127/19*, *157/09*
U.S. Cl. 260—553 A 6 Claims

1. A compound of the formula:



wherein R_1 is selected from the group consisting of alkyl C_1–C_4, alkoxy C_1–C_4, benzyl and benzyloxy; R_2 is selected from the group consisting of hydrogen and alkyl C_1–C_4; R_7 and R_8 are each individually selected from the group consisting of hydrogen, alkyl C_1–C_4 and alkoxy C_1–C_4; and R_9 is selected from the group consisting of hydrogen and alkyl C_1–C_4, with the proviso that at least one of R_7, R_8, and R_9 is hydrogen.

3,953,507

N-T-BUTYL-α-(3,5-SUBSTITUTED PHENOXY) ALKYL AMIDES AND THEIR USE AS HERBICIDES

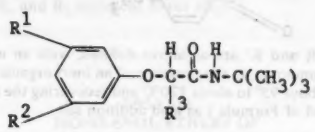
Don R. Baker, Orinda, and Francis H. Walker, Mill Valley, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 393,390, Aug. 31, 1973, abandoned, which is a continuation of Ser. No. 282,507, Aug. 21, 1972, abandoned, which is a continuation of Ser. No. 156,974, June 25, 1971, abandoned. This application Oct. 29, 1974, Ser. No. 518,921

Int. Cl.² C07C *103/76*

U.S. Cl. 260—559 B **3 Claims**

1. A compound of the formula



in which R^1 and R^2 are both methyl or both chlorine and R^3 is ethyl.

3,953,508

DIPHENYLAMINES FOR DYEING KERATINOUS FIBERS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

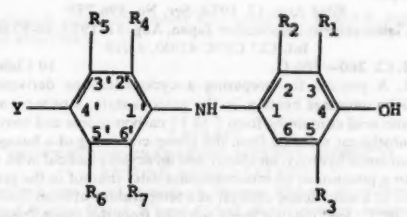
Continuation-in-part of Ser. No. 301,715, Oct. 30, 1972, abandoned, which is a division of Ser. No. 61,833, Aug. 6, 1970, Pat. No. 3,792,090. This application Jan. 14, 1974, Ser. No. 432,982

Claims priority, application Luxemburg, Aug. 11, 1969, 59265

Int. Cl.² C07C *103/34*

U.S. Cl. 260—562 A **6 Claims**

1. Diphenylamine having the formula:



wherein

Y represents a member selected from the group consisting of hydroxy and amino;

R_1 and R_3, each independently, represent a member selected from the group consisting of hydrogen, halogen, lower alkyl, and —NHCOR wherein R is lower alkyl;

R_2 represents a member selected from the group consisting of hydrogen, halogen, lower alkyl, —NHCOR wherein R is lower alkyl and —NHR_8 wherein R_8 represents a member selected from the group consisting of hydrogen, lower alkyl and carbamyl lower alkyl, with the proviso that when R_2 is —NHR_8, R_3 is not hydrogen;

R_4, R_5, R_6 and R_7 each independently represent a member selected from the group consisting of hydrogen, halogen, lower alkyl and lower alkoxy, with the proviso (1) that when Y is hydroxy, R_2 is not hydrogen, lower alkyl or alkoxy, (2) that when Y is amino at least two of R_1, R_2 and R_3 are other than hydrogen and R_2 is not hydrogen when R_4, R_5, R_6 and R_7 are all hydrogen and (3) that R_1 or R_3 is NHCOR wherein R has the meaning given above or R_8 is carbamyl lower alkyl.

3,953,509

HYDROGENATION OF NITROBENZENE TO p-AMINOPHENOL

Nicholas P. Greco, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 296,260, Oct. 10, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 447,848

Int. Cl.² C07C *85/10*

U.S. Cl. 260—580 **6 Claims**

1. In a method for the preparation of p-aminophenol by reducing nitrobenzene with hydrogen at elevated temperatures in an acid solution and in the presence of a catalyst, the improvement comprising a catalyst selected from the group consisting of powdered molybdenum sulfide-on-carbon and powdered platinum sulfide-on-carbon.

3,953,510

METHOD FOR THE PREPARATION OF ALKOXYANILINES

Curtis P. Smith, Cheshire, Conn., and Peter H. Scott, Sudbury, Mass., assignors to Olin Corporation, New Haven, Conn.

Continuation of Ser. No. 248,898, May 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 8,060, Feb. 2, 1970, abandoned. This application June 27, 1974, Ser. No. 483,605

Int. Cl.² C07C *85/10*

U.S. Cl. 260—580 **13 Claims**

1. A method for preparing an o- or p- alkoxyaniline or substituted o- or p- alkoxyaniline which comprises reacting at a temperature of from about 20° to about 250°C. a mixture of

a. a nitrobenzene selected from the group consisting of nitrobenzene and substituted nitrobenzene having as an additional substituent on the benzene ring at least one of the following: alkyl of 1 to 4 carbon atoms, halogen and nitro, with the proviso that at least one of the para or ortho positions to the nitro group is unsubstituted;

b. an alcohol selected from the group consisting of unsubstituted, branched and unbranched, hydroxyalkyl and hydroxyalkenyl alcohols of 1 to 8 carbon atoms and polyoxyalkylene glycol ether alcohols of the formula:

$$R(OR_1)_xOH$$

wherein R is an alkyl of 1 to 4 carbon atoms, R_1 is an ethylene or propylene group and x is 1 to 20;

c. a deoxygenating agent selected from the group consisting of phosphorus, sulfur, phosphorus trihalides, sulfur halides in which sulfur has a valence lower than 6, aryl and diaryl phosphorus halides and aryl and diaryl sulfur halides, wherein the aryl group contains 6 to 10 carbon atoms, and triaryl phosphines wherein the aryl group contains 6 to 10 carbon atoms; and

d. anhydrous hydrogen fluoride,

said mixture containing a molar ratio of from about 1:1 to about 50:1 of said alcohol to said selected nitrobenzene, a molar ratio of from about 0.3:1 to about 5:1 of said deoxygenating agent to said selected nitrobenzene and a molar ratio of about 1:1 to about 50:1 of said hydrogen fluoride to said selected nitrobenzene and then separating said resulting o- or p- alkoxyaniline or o- or p- substituted alkoxyaniline from the reaction mixture.

3,953,511

PREPARATION OF 2-METHYL-1,5-DIAMINOPENTANE

Kenneth J. Frech, Tallmadge, and Lawson G. Wideman, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 4, 1974, Ser. No. 520,517
Int. Cl.² C07C 85/11, 87/14
U.S. Cl. 260—583 K 2 Claims

1. The method for the preparation of 2-methyl-1,5-diaminopentane which comprises hydrogenating α-methylene glutaronitrile in a multi-stage hydrogenation employing as the hydrogenation catalyst in both hydrogenation stages T-1 Raney nickel or modified T-1 Raney nickel wherein the first stage hydrogenation is conducted at a temperature ranging from about 20°C to about 50°C and at a hydrogen pressure of at least about 14 kg/cm² and wherein the second stage hydrogenation is conducted at temperatures ranging from about 120°C to about 140°C and a hydrogen pressure of at least about 42 kg/cm².

3,953,512

PROCESS FOR MANUFACTURING 2-AMINOBUTANOL

Czeslaw Belzecki; Witold Tomasik, and Jerzy Trojnar, all of Warsaw, Poland, assignors to Polska Akademia Nauk Instytut Chemii Organicznej, Warsaw, Poland

Filed Mar. 18, 1974, Ser. No. 452,372
Claims priority, application Poland, Mar. 20, 1973, 161371
Int. Cl.² C07C 91/02, 93/02, 93/10, 95/02
U.S. Cl. 260—584 R 5 Claims

1. A process for the preparation of 2-aminobutanol comprising reacting 1,2-epoxybutane or butylene halogenhydrines with ammonia to form a mixture of isomeric aminobutanols, converting said mixture into 2-ethylaziridine by means of esterification with sulphuric acid, followed by reaction with alkali hydroxide; reacting 2-ethylaziridine with an aromatic carboxylic acid or with an anhydride of an orthobicarboxylic aromatic acid to produce an amide or a polyamide of 2-aminobutanol, and hydrolyzing with a mineral acid.

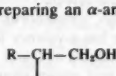
3,953,513

PROCESS FOR PREPARING α-AMINOALCOHOLS

Ernesto Oppici, Milan, Italy, assignor to Gruppo Lepetit S.p.A., Milan, Italy

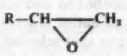
Filed Nov. 8, 1974, Ser. No. 521,997
Claims priority, application United Kingdom, Nov. 29, 1973, 55347/73
Int. Cl.² C07C 89/02
U.S. Cl. 260—585 C 6 Claims

1. A process for preparing an α-aminoalcohol of formula



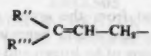
I

wherein R represents hydrogen or alkyl of from 1 to 5 carbon atoms which comprises contacting a compound of formula

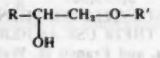


II

wherein R has the same meaning as above, with an alcohol of formula R'-OH wherein R' stands for benzyl or represents the group

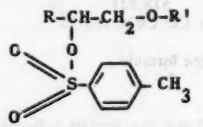


in which R'' and R''' are independently selected from hydrogen and alkyl of from 1 to 4 carbon atoms in an organic solvent, in the presence of a basic catalyst, at from about 140° to about 170°C treating, the obtained product of formula



III

wherein R and R' have the above meanings, with at least an equimolecular amount of p-toluenesulfonyl halide, at from about −5° to about 20°C in the presence of a tertiary organic nitrogen containing base and reacting in a closed system the resulting compound of formula



IV

wherein R and R' are as above defined, with an excess of gaseous ammonia, in the presence of an inert organic solvent, at from about 95° to about 120°C and recovering the resulting compound of Formula I as acid addition salt.

3,953,514

PROCESS FOR PREPARING CYCLOPENTENONE DERIVATIVES

Toshiharu Yamazaki; Mamoru Nakai, and Yoshiaki Kuroki, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Aug. 12, 1974, Ser. No. 496,755
Claims priority, application Japan, Aug. 31, 1973, 48-97349
Int. Cl.² C07C 45/00, 45/18
U.S. Cl. 260—586 C 10 Claims

1. A process for preparing a cyclopentanone derivative which comprises heating, in the gaseous state, a primary aliphatic acid containing from 5 to 13 carbon atoms and having a substituent selected from the group consisting of a halogen atom and a hydroxy, an alkoxy and an acyloxy radical in an γ-, δ- or ε-position or an intramolecular ester thereof in the presence of a solid acidic catalyst at a temperature of from 200°C. to 500°C., said catalyst being selected from the group consisting of silica-alumina, silica-magnesia, silica-boria, alumina-boria, silica-titania, sodium phosphate, calcium phosphate, magnesium phosphate, boron phosphate, zirconium phosphate, titanium phosphate, solid phosphoric acid, nickel sulfate, zinc sulfate, calcium sulfate, manganese sulfate, copper sulfate, cobalt sulfate, cadmium sulfate, strontium sulfate, magnesium sulfate, ferric sulfate, barium sulfate, potassium hydrogen sulfate, potassium sulfate, aluminum sulfate and chromium oxide, unsupported or supported on silica gel, alumina or diatomaceous earth.

3,953,515

4-ACETYL-3,3,5,5 TETRAALKYLCYCLOHEXANONES

Bernard Pierre Corbier, and Paul Jose Teisseire, both of Grasse, France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

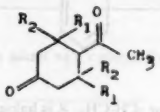
Division of Ser. No. 110,652, Jan. 28, 1971, Pat. No. 3,875,241, which is a continuation-in-part of Ser. No. 585,269, Oct. 10, 1966, Pat. No. 3,578,715. This application Feb. 3, 1975, Ser. No. 546,531

Claims priority, application Switzerland, Oct. 14, 1965, 14216/65

Int. Cl.² C07C *49/61*

U.S. Cl. 260—586 R 3 Claims

1. Compounds having the formula



II

wherein R_1 and R_2 represent lower alkyl.

3,953,516

MONO-ENOL ETHERS OF 4-ACETYL-3,3,5,5-TETRAMETHYLCYCLOHEXANONE

Bernard Pierre Corbier, and Paul Jose Teisseire, both of Grasse, France, assignors to Societe Anonyme Roure Bertrand Dupont, Paris, France

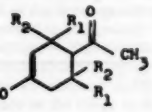
Division of Ser. No. 110,652, Jan. 28, 1971, Pat. No. 3,875,241, which is a continuation-in-part of Ser. No. 585,259, Oct. 10, 1966, Pat. No. 3,578,715. This application Feb. 3, 1975, Ser. No. 546,533

Claims priority, application Switzerland, Oct. 14, 1965, 14216/65

Int. Cl.² C07C *46/26*

U.S. Cl. 260—586 R 8 Claims

1. Compounds having the formula



III

wherein R represents a lower alkyl group and R_1 and R_2 represent lower alkyl.

3,953,517

PROCESS FOR PREPARING METHYL ISOBUTYL KETONE AND CATALYST

Karl Schmitt; Josef Disteldorf; Werner Flakus, all of Herne, and Werner Hubel, Wanne-Eickel, all of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Germany

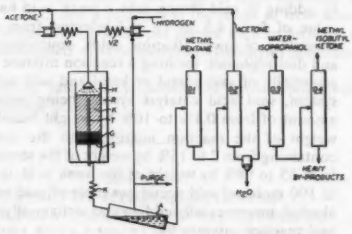
Continuation-in-part of Ser. No. 756,997, Sept. 3, 1968, abandoned. This application July 10, 1973, Ser. No. 377,979

Claims priority, application Germany, Sept. 8, 1967, 1643044

Int. Cl.² C07C *49/04*

U.S. Cl. 260—593 R 5 Claims

1. In a process for preparing methyl isobutyl ketone from acetone and hydrogen the improvement which comprises contacting hydrogen and acetone in the presence of a catalyst at a temperature of from about 50°-200°C and a pressure between 60 and 100 atmospheres, said catalyst being a cation



exchange resin having 0.001 to 0.08 weight percent noble metal in monoatomic form distributed therein.

3,953,518

PROCESS FOR PREPARING γ, δ-UNSATURATED CARBONYL COMPOUNDS

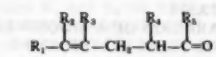
Pius Anton Wehrli, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 376,500, July 5, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 535,591

Int. Cl.² C07C *45/00*

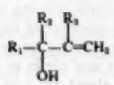
U.S. Cl. 260—593 R 4 Claims

1. In a process for obtaining γ,δ-unsaturated carbonyl compounds of the formula:



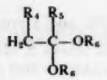
wherein R_1 is selected from the group consisting of (a) a saturated hydrocarbon group, (b) an unsaturated hydrocarbon group, (c) an aralkyl group, (d) an aryl group, and (e) an oxygen-containing derivative of (a), (b), and (c) wherein the oxygen is in the form of free hydroxy, esterified hydroxy, wherein the esterifying group is an acyloxy group in which the acyl moiety is from an acid selected from the group consisting of lower alkanoic acids and benzoic acid, and etherified hydroxy selected from the group consisting of lower alkoxy and phenyloxy, and wherein the oxygen atom is attached to an aliphatic carbon atom on said group; R_2 is a lower aliphatic hydrocarbon; R_3, R_4 and R_5 are selected from the group consisting of hydrogen and a lower aliphatic hydrocarbon and wherein R_1 taken together with R_2 can form a carbocyclic ring, and R_4 taken together with R_5 can form a carbocyclic ring;

comprising the steps of reacting a tertiary allyl alcohol of the formula:



wherein R_1, R_2 and R_3 are as above;

with an acetal or ketal of the formula:



wherein R_4 and R_5 are as above and R_6 is alkyl; in the presence of a strong acid having a pK value of 0.4 to 3, the improvement which comprises forming a catalyst system by adding to said strong acid a weak acid having a pK value of from 4.5 to 10 and selected from the group consisting of lower alkanoic acids, dinitrobenzoic acids and dinitrophenol; forming a reaction mixture consisting essentially of said acetal or ketal and said acid catalyst system, said acid catalyst system being present in an amount of from 0.1% to 10% by weight based upon the weight of the reaction mixture with the acid catalyst containing from 2 to 15% by weight of the strong acid and from 85 to 98% by weight of the weak acid, to provide 3 to 100 moles of said acetal per mole of said tertiary allyl alcohol; incrementally adding said tertiary allyl alcohol to said reaction mixture by

a. reacting the first increment of the tertiary allyl alcohol with the reaction mixture at a temperature of from 50°C. to 200°C. and a pressure of from 10 to 50 atmospheres to form said carbonyl compound and a primary alcohol of the formula

R_6—OH

wherein R_6 is as above

said alcohol forming an azeotrope with said acetal or ketal;

b. distilling off said azeotrope from said reaction mixture; and

c. adding subsequent increments of said tertiary alcohol to said reaction mixture, with each of said subsequent increments being added after said reaction of the previous increment with said reaction mixture and said distillation of said azeotrope formed has been carried out.

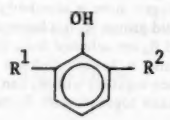
3,953,519

PROCESS FOR THE PREPARATION OF A THIOBIS-2,6-DISUBSTITUTED PHENOL FROM SULFUR AND A PHENOL

Allan S. Hay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed July 1, 1974, Ser. No. 484,995
Int. Cl.² C07C 148/02
U.S. Cl. 260—609 D 21 Claims

1. A process for the preparation of thiobisphenol which comprises the reaction of a member of the class consisting of sulfur, an alkali metal sulfide, an alkaline earth metal sulfide, or an ammonium sulfide with a phenol of the formula



wherein independently each R^1 and R^2 is a monovalent substituent selected from the group consisting of C_{1-30} hydrocarbon and C_{1-30} hydrocarbonoxy radicals, said reaction being carried out in the presence of (1) a base, (2) a member of the class consisting of an activated olefin or an epoxy compound, wherein the mole ratio of said phenol to said olefin or epoxy compound is within the range of from about 1:0.1 to about 1:10, and in the absence of (3) a solvent having a dielectric constant greater than about 20.

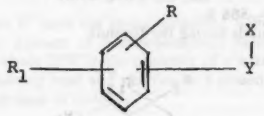
3,953,520

CHEMICAL COMPOUNDS AND PROCESSES

Robert F. Czaja, Scotch Plains; Seemon H. Pines, Murray Hill, and Newton L. Abramson, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

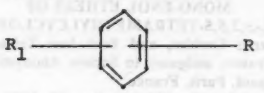
Continuation-in-part of Ser. No. 426,865, Dec. 20, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,486
Int. Cl.² C07C 149/34
U.S. Cl. 260—609 E 7 Claims

1. A process for preparing a compound of the formula:



wherein Y is $-CH_2$ or $-CH-CH_3$; X is halogen and R and R_1 are each hydrogen, C_{1-5} alkyl, C_{1-5} alkylthio, C_{1-5} alkoxy, hydroxy or halo, at least one of said R or R_1 being C_{1-5} alkylthio, which comprises the steps of:

a. reacting at about 0°C to 40°C a benzene compound of the formula:



where R and R_1 are as defined above, with an alkane compound selected from the group consisting of di-C_{1-5} alkoxymethane, di-C_{1-5} alkoxyethane, di-C_{7-10} aralkoxymethane and di-C_{7-10} aralkoxyethane and a halogen containing Lewis acid to form a complex; and

b. cleaving said complex to form the desired product.

3,953,521

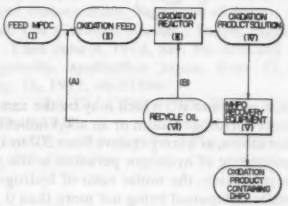
PROCESS FOR THE CONTINUOUS PRODUCTION OF DIHYDROPEROXIDES

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya; Takashi Chinuki, Toyonaka; Kenji Tanimoto; Hirokazu Hosaka, both of Minoo; Yukimichi Nakao, Kobe; Yuji Ueda, Izumiotsu; Seiya Imada, Sakai; Hideki Yanagihara, Toyonaka, and Kunihiko Tanaka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 388,477, Aug. 15, 1973, abandoned. This application June 27, 1975, Ser. No. 590,930
Claims priority, application Japan, Aug. 23, 1972, 47-84733
Int. Cl.² C07C 179/06
U.S. Cl. 260—610 B 4 Claims

1. A process for continuously producing meta- and paradiisopropylbenzene dihydroperoxides by oxidation of the mta- and paradiisopropylbenzenes in liquid phase through contact with oxygen or a gas containing oxygen, which comprises effecting the oxidation while keeping the concentration of meta- and paradiisopropylbenzene monohydroperoxides of the oxidation product solution in a range of 20 to 40% by weight, the oxidation being carried out at a temperature of 80°

to 130°C for 1 to 30 hours and at a pressure from atmospheric to 10 atmospheres maintained by feeding compressed air and



in the presence of an alkali as a catalyst for adjusting the pH from 5 to 12.

3,953,522
PROCESS FOR THE PREPARATION OF N-ALKYL-SUBSTITUTED HYDROXYPOLYALKOXYMETHYLCYCLOHEXANES

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 277,835, Aug. 3, 1972, Pat. No. 3,859,324. This application Nov. 4, 1974, Ser. No. 520,694

Int. Cl.² C07C *41/02*

U.S. Cl. 260—611 B **7 Claims**

1. A process for the preparation of a biodegradable detergent which comprises the steps of:

a. condensing butadiene with allyl alcohol in a Diels-Alder reaction at a temperature in the range of from about 50° to about 190° C. and a pressure in the range of from atmospheric to about 100 atmospheres to form hydroxymethylcyclohexene;

b. selectively hydrogenating said hydroxymethylcyclohexene to form hydroxymethylcyclohexane;

c. ring alkylating said hydroxymethylcyclohexane with a 1-alkene in the presence of an organic peroxy free-radical generating compound and hydrogen chloride at a temperature at least as high as the decomposition temperature of said free-radical generating compound;

d. alkoxylating the resultant n-alkyl-substituted hydroxymethylcyclohexane with an alkoxylating agent selected from the group consisting of ethylene oxide and propylene oxide at a temperature in the range of from 20° to about 125° C. and a pressure of from about 50 to about 1000 pounds per square inch; and

e. recovering the resultant n-alkyl-substituted hydroxypolyalkoxymethylcyclohexane.

3,953,523
PROCESS FOR THE PREPARATION OF N-ALKYL-SUBSTITUTED HYDROXYPOLYALKOXYMETHYLCYCLOHEXENES

Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 277,835, Aug. 3, 1972, Pat. No. 3,859,324. This application Nov. 4, 1974, Ser. No. 520,696

Int. Cl.² C07C *41/02*

U.S. Cl. 260—611 B **7 Claims**

1. A process for the preparation of a biodegradable detergent which comprises the steps of:

a. condensing butadiene with allyl alcohol in a Diels-Alder reaction at a temperature in the range of from about 50° to about 190° C. and a pressure in the range of atmospheric to about 100 atmospheres to form hydroxymethylcyclohexene;

b. ring alkylating said hydroxymethylcyclohexene with a 1-alkene in the presence of an organic peroxy free-radical generating compound and hydrogen chloride at a temperature at least as high as the decomposition temperature of said free-radical generating compound;

c. alkoxylating the resultant n-alkyl-substituted hydroxymethylcyclohexene with an alkoxylating agent selected from the group consisting of ethylene oxide and propylene oxide at a temperature in the range of from about 20° to about 125° C. and a pressure in the range of from about 50 to about 1000 pounds per square inch to form an n-alkyl-substituted hydroxypolyalkoxymethylcyclohexene; and

d. recovering said n-alkyl-substituted hydroxypolyalkoxymethylcyclohexene.

3,953,524
CATALYTIC HYDROGENATION OF ALPHA,BETA-UNSATURATED ALDEHYDES TO ALPHA,BETA-UNSATURATED ALCOHOLS

Kurt Steiner, Starrkirch, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

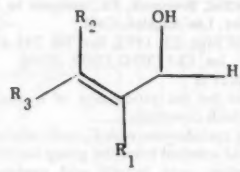
Filed Mar. 11, 1974, Ser. No. 450,134

Claims priority, application Switzerland, Mar. 21, 1973, 4098/73

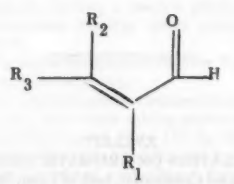
Int. Cl.² C07C *29/14*

U.S. Cl. 260—617 A **15 Claims**

1. A process for preparing an alpha, beta-unsaturated alcohol of the formula:



wherein R_1 and R_2 are hydrogen or lower alkyl; and R_3 is hydrocarbyl, cyclohydrocarbyl or aryl; or R_1 and R_3 taken together or R_2 and R_3 taken together form a cyclohydrocarbyl or aryl group; said hydrocarbyl being unsubstituted or substituted with a lower alkyl, lower alkoxy, lower alkanoyloxy o. cyclohydrocarbyl substituents and said aryl and cyclohydrocarbyl being unsubstituted or substituted in one or more positions with lower alkyl, lower alkoxy or lower alkanoyloxy substituents; comprising hydrogenating with hydrogen gas an alpha, beta-unsaturated aldehyde of the formula:



wherein R_1, R_2 and R_3 are as above; said hydrogenation being carried out in an inert organic polar solvent medium in the presence of a catalyst suspended in said medium, said catalyst being elemental platinum with its surface coated with elemental cobalt where the catalyst contains from 1 to 100 moles of elemental platinum per mole of cobalt, said hydrogenation being carried out at pressures of from about 0 to 1,000 psig and temperatures of from about 15° C. to 60° C.

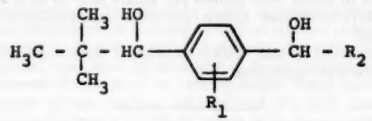
3,953,525

α-SUBSTITUTED-4-(2,2-DIMETHYL-1-HYDROXYPROPYL)BENZYL ALCOHOLS AND ESTERS

Paul L. Anderson, Dover, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Nov. 19, 1974, Ser. No. 525,177
Int. Cl.² C07C 31/18
U.S. Cl. 260—618 R 3 Claims

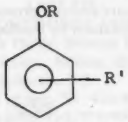
1. A compound of the formula



where

R_1 is hydrogen or halo having an atomic weight of 19 80, and

R_2 is lower alkyl.



in which each of R and R', which may be the same or different, represents a hydrogen atom or an alkyl radical containing 1 to 4 carbon atoms, at a temperature from 20° to 150°C., with a reagent consisting of hydrogen peroxide in the presence of phosphorus pentoxide, the molar ratio of hydrogen peroxide to the aromatic compound being not more than 0.3:1 and the ratio of the number of molecules of hydrogen peroxide to the number of gram atoms of phosphorus in the phosphorus pentoxide being from 0.5:1 to 10:1.

3,953,526

SYNTHESIS OF HYDROQUINONE

Rudolph Rosenthal, Broomall, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 22, 1972, Ser. No. 291,418
Int. Cl.² C07C 37/00, 37/06
U.S. Cl. 260—621 H 13 Claims

1. A method for the production of hydroquinone from cyclohexene which comprises

a. contacting cyclohexene with C_2 to C_6 aliphatic monocarboxylic acid selected from the group consisting of acetic acid, propionic acid, butyric acid, pentanoic acid, and hexanoic acid and a secondary or tertiary organic hydroperoxide having the formula ROOH wherein R may be alkyl, cycloalkyl or aralkyl in the presence of a copper compound as the catalyst in the liquid phase at a temperature in the range of from about 25° C. to 120° C. to produce a 3,6-diacyloxycyclohexene wherein at least 2 moles of said acid and 2 moles of said hydroperoxide are employed per mole of cyclohexene,

b. hydrolyzing the 3,6-diacyloxycyclohexene to 3,6-dihydroxycyclohexene and

c. catalytically dehydrogenating the 3,6 dihydroxycyclohexene to hydroquinone.

3,953,527

HYDROXYLATION OR AROMATIC COMPOUNDS

Pierre Bost; Michel Constantini, both of Lyon; Michel Jouffret, Francheville-le-Bas, and Guy Lartigau, Lyon, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

Filed May 1, 1973, Ser. No. 356,121
Claims priority, application France, May 3, 1972, 72.15697
Int. Cl.² C07C 39/08, 39/06, 43/20
U.S. Cl. 260—621 G 3 Claims

1. A process for the preparation of hydroxylated aromatic compound, which consists of hydroxylating a compound of the general formula:

3,953,528

PROCESS FOR SUBLIMATION PURIFICATION OF CRUDE HYDROQUINONE WITH STIRRED AND FLUIDIZED BED

Kazutoshi Inada, Minami-ashigara; Masatoshi Sugiyama; Yasuo Nishigaki, both of Odawara, and Sugihiko Tada, Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 14, 1973, Ser. No. 397,472
Claims priority, application Japan, Sept. 14, 1972, 47-92503
Int. Cl.² C07C 37/22, 37/38
U.S. Cl. 260—621 A 15 Claims

1. A process for purifying hydroquinone comprising introducing crude hydroquinone prepared using the aniline process containing impurities into a stirred and fluidized bed, passing a dried carrier gas which contains no more than about 0.5% by weight moisture and which is inert to the hydroquinone through said bed, and holding the temperature in said bed at about 110° to 170°C and the pressure at from 680 to 880 mmHg, which temperature is below the melting point of hydroquinone, whereby the crude hydroquinone is sublimed, and thereafter introducing a gaseous mixture of said carrier gas and sublimed vapor into a condenser at a temperature of about 25° to 90°C whereby the hydroquinone only is solidified from said gaseous mixture.

8. A process for purifying hydroquinone comprising introducing crude hydroquinone containing impurities into a stirred and fluidized bed, said crude hydroquinone having been prepared by the acid catalyzed decomposition of p-diisopropylbenzenedihydroperoxide obtained from the air oxidation of p-diisopropylbenzene, passing a dried carrier gas which contains no more than about 0.5% by weight moisture and which is inert to the hydroquinone through said bed, and holding the temperature in said bed at about 110° to 170°C and the pressure at from 680 to 880 mmHg, which temperature is below the melting point of hydroquinone, whereby the crude hydroquinone is sublimed, and thereafter introducing a gaseous mixture of said carrier gas and sublimed vapor into a condenser at a temperature of about 25° to 90°C whereby the hydroquinone only is solidified from said gaseous mixture.

3,953,529
PROCESS FOR ORTHO-ALKYLATION OF PHENOL COMPOUNDS

Eiichi Yonemitsu, Kashiwa; Shizuo Togo, Tokyo; Kenichiro Hashimoto, Tokyo; Muneo Ito, Tokyo; Chiharu Nishizawa, Tokyo, and Noboru Hara, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Co. Inc., Tokyo, Japan

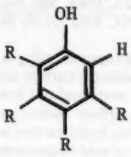
Filed June 4, 1974, Ser. No. 476,268

Claims priority, application Japan, June 12, 1973, 48-66025; Aug. 16, 1973, 48-01894

Int. Cl.² C07C *39/06, 39/12*

U.S. Cl. 260—621 R 8 Claims

1. A process for alkylating the orthoposition of a phenol compound of the formula



wherein R's may be the same or different, and each represents a monovalent substituent such as a hydrogen atom, an alkyl group of 1 to 6 carbon atoms, or a phenyl group, which comprises bringing a phenol compound containing at least one hydrogen atom at its ortho-position and a lower saturated aliphatic alcohol containing 1 to 4 carbon atoms into contact with a catalyst in the gaseous phase at a pressure of atmospheric to 40 Kg/cm².G and at a temperature of 300° to 450°C, said catalyst being selected from the group consisting of

a. a mixture of iron oxide and silica in which the atomic ratio of Fe to Si is 100 : 0.03 – 200, and

b. a mixture of iron oxide, silica and chromium oxide in which the atomic ratio of Fe to Si to Cr is 100 : 0.1 – 5 : 0.1 – 5.

3,953,530
PROCESS FOR MAKING o- AND p-CHLOROPHENOLS

Lothar G. Dulog, Sint Martens Latem, and Sylvain A. R. Dewaele, Evergem, both of Belgium, assignors to S. A. Texaco Belgium N.V., Brussels, Belgium

Filed Jan. 10, 1972, Ser. No. 216,768

Int. Cl.² C07C *39/28*

U.S. Cl. 260—623 R 4 Claims

1. A process for making ortho- and para- chlorophenols which comprises reacting alpha-cumylchloride with aqueous hydrogen peroxide at a temperature ranging from about 40 to about 100°C. and distilling the resulting reaction mass to recover said ortho and para chlorophenols.

3,953,531
ALKYLHYDROQUINONE AND PROCESS FOR PRODUCING THE SAME

Reiichi Ohi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Dec. 19, 1974, Ser. No. 534,393

Claims priority, application Japan, Dec. 19, 1973, 48-143287

Int. Cl.² C07C *39/08*

U.S. Cl. 260—625 1 Claim

1. 2,5-bis-(1',1'-Dimethylbutyl)hydroquinone.

3,953,532
4,8-TRIDECADIEN-1-OL,4 CIS,8 CIS,TRANS

Richard J. Anderson, and Clive A. Henrick, both of Palo Alto, Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 463,938, April 25, 1974, Pat. No. 3,919,329. This application Apr. 14, 1975, Ser. No. 567,907

Int. Cl.² C07C *33/02*

U.S. Cl. 260—632 R 1 Claim

1. A compound of the formula:

$$CH_3\text{-}(CH_2)_3\text{-}CH{=}CH\text{-}(CH_2)_3\text{-}CH{=}CH\text{-}(CH_2)_2\text{-}CH_2OH$$

having cis isomerism at position C-4 and a mixture of cis and trans isomerism at position C-8.

3,953,533
PROCESS FOR THE HYDRATION OF OLEFINS TO ALCOHOLS

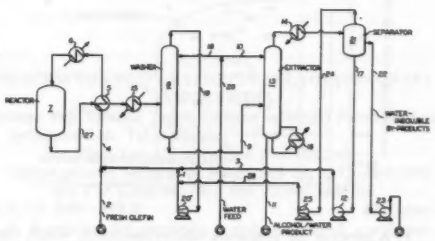
August Sommer, Herne, and Martin Urban, Gelsenkirchen-Buer, both of Germany, assignors to Veba-Chemie Aktiengesellschaft, Gelsenkirchen-Buer, Germany

Filed Jan. 11, 1974, Ser. No. 432,727

Claims priority, application Germany, Jan. 11, 1973, 2301208

Int. Cl.² C07C *29/04*

U.S. Cl. 260—641 4 Claims



1. Process for the hydration of ethylene in the presence of phosphoric acid-containing supported catalysts to ethanol which comprises:

a. carrying out the hydration in the vapor phase under conditions wherein the molar ratio of water to ethylene is in the range of about 0.1 to 0.3 : 1, the reaction temperature is in the range of about 190°–230°C, and the reaction pressure is in the range of about 60 to 80 atmopheres gauge, thereby forming a reaction product mixture containing unreacted ethylene steam volatile by-products and ethanol;

b. separating unreacted gaseous ethylene from the reaction product mixture from (a);

c. feeding the reaction product mixture from (b) to a washing extraction zone where said by-products are separated from said ethanol using 50 to 150 kg of steam per 100 liters of pure ethanol to vaporize said by-products which are removed overhead, said ethanol, free of said by-products, being withdrawn from the sump of said washing zone; and

d. thereafter condensing the steam and volatilized by-products withdrawn overhead from the washing zone in step (c) and recycling same to hydration step (a) thereby supplying the water required for the hydration and increasing the concentration of the by-products which prevents the further formation of by-products in the hydration.

3,953,534
CYCLOALIPHATIC COMPOUNDS AS ODOUR- AND TASTE-MODIFYING AGENTS

Erling Sundt, Pinchat-Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

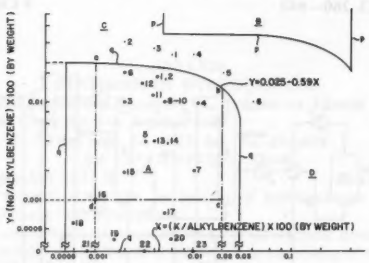
Division of Ser. No. 292,723, Sept. 27, 1972, abandoned. This application Dec. 2, 1974, Ser. No. 528,669
Claims priority, application Switzerland, Oct. 11, 1971, 14784/71; May 19, 1972, 7456/72
Int. Cl.² C07C *13/48*
U.S. Cl. 260—666 PY **4 Claims**

1. 4-Methyl-tricyclo[6.2.1.0^{2,7}]undec-4-ene.

3,953,535
PROCESS FOR THE PREPARATION OF ALKENYLBENZENES

Takeo Shima; Takanori Urasaki, both of Iwakuni, and Iwao Omae, Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 495,762, Aug. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 422,648, Dec. 7, 1973, abandoned. This application Dec. 9, 1974, Ser. No. 530,583
Int. Cl.² C07C *3/52*
U.S. Cl. 260—668 B **7 Claims**



1. A process for preparing alkenylbenzenes, which comprises reacting an alkylbenzene with 1,3-butadiene at an elevated temperature in the presence of an alkali metal catalyst in the substantial absence of oxygen and moisture, characterized in that said catalyst is composed of

1. 0.0005 to 0.03% by weight, based on the alkylbenzene, of metallic potassium, and
2. metallic sodium in an amount expressed in percent by weight, based on the alkylbenzene, determined by the following relationship (i)

$$-0.59x + 0.025 \geqq Na \qquad (i)$$

wherein x is the amount expressed in percent by weight of the metallic potassium used.

3,953,536
CATALYST TREATMENT

Alistair Chalmers Ramsay Brown; Norman Andrew Dykes; John Kenneth January, and Ivan James Samuel Lake, all of Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 346,859, April 2, 1973, Pat. No. 3,898,182. This application May 19, 1975, Ser. No. 578,812
Claims priority, application United Kingdom, Apr. 24, 1972, 18824/72
Int. Cl.² C07C *5/24, 15/08*
U.S. Cl. 260—668 A **9 Claims**

1. A process which comprises isomerising a mixture of xylenes containing less than an equilibrium concentration of paraxylene at a temperature in the range 200° to 600°C, at a pressure in the range 0.5 to 50 atmospheres by contacting the mixture with a silica catalyst prepared by a process which comprises exposing a silicia catalyst, which is normally susceptible to damage during exposure to an aqueous liquid, to steam at less than its saturated vapour pressure and then contacting the catalyst with the aqueous liquid and drying the catalyst after exposure to the aqueous liquid.

3,953,537
DISPROPORTIONATING C_5–C_6 PARAFFINS OVER ZEOLITES

Frank J. Chloupek, South Holland, Ill.; Robert A. Sanford, Prospect, Ky.; Laszlo Pollak, Chicago, Ill., and Ronald A. Kmecak, Ashland, Ky., assignors to Atlantic Richfield Company, Philadelphia, Pa.

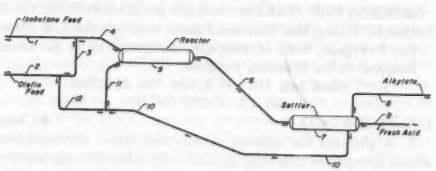
Filed Jan. 22, 1969, Ser. No. 793,173
Int. Cl.² C07C *3/62, 5/52;* **B01J** *29/12*
U.S. Cl. 260—676 R **21 Claims**

1. A process for disproportionating a paraffinic hydrocarbon containing up to about 6 carbon atoms to produce compounds containing one more and one less carbon fragment per molecule than said paraffinic hydrocarbon which comprises contacting said paraffinic hydrocarbon at conditions sufficient for disproportionation of said hydrocarbon and insufficient to cause substantial cracking of the hydrocarbon said contacting occurring at a temperature in the range of about 400° to 1,000°F., with a crystalline aluminosilicate having a pore size of about 10 to 14 Angstrom units and a silica to alumina mole ratio greater than about 3 to 1 to about 11 to 1, said catalyst containing less than about 0.5 equivalent of alkali metal per gram atom of aluminum and at least about 0.4 equivalent per gram atom of aluminum in the aluminosilicate of hydrogen or metal ion, said metal ion being selected from the group consisting of silver, copper, mercury, polyvalent metals, and mixtures thereof, and recovering said paraffin hydrocarbons containing one more and one less carbon fragment.

3,953,538
ALKYLATION PROCESS STARTUP PROCEDURE

William G. Boney, Rolling Meadows, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 340,126, March 12, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,409
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **2 Claims**



2. A hydrofluoric acid-catalyzed alkylation process which comprises the steps of:

a. admixing a first olefinic hydrocarbon stream comprising mono-olefins having from 2 to about 6 carbon atoms per molecule with an alkylatable hydrocarbon stream comprising isoparaffins having from 4 to 7 carbon atoms per molecule and effecting the formation of a reactant mixture which is substantially free of hydrofluoric acid;
b. passing the reactant mixture into a reaction zone which contains a quantity of liquid phase hydrofluoric acid catalyst comprising less than 5 wt.% water and which is maintained under alkylation conditions, effecting the reaction of the mono-olefins with the isoparaffins and the production of high-octane gasoline blending components;
c. effecting the formation of a second olefinic hydrocarbon stream by diverting a portion of the first olefinic hydrocarbon stream, and passing the second olefinic hydrocarbon stream into a polymerization zone maintained under

conditions including a temperature of from 0°F. to about 200°F. and a pressure of from about 20 psig. to about 500 psig. and in which there are substantially no isoparaffins present;

d. contacting the second olefinic hydrocarbon stream with liquid hydrofluoric acid and effecting a polymerization of essentially all of the second olefinic hydrocarbon stream and the formation of a polymeric diluent;

e. admixing the polymeric diluent with the hydrofluoric acid catalyst contained with in the reaction zone and effecting a reduction in the weight percentage of hydrofluoric acid in the hydrofluoric acid catalyst contained in the reaction zone; and,

f. continuing the polymerization of the hydrocarbon stream in step (d) until the average acid strength in the hydrofluoric acid retained in the alkylation zone is reduced to about 86 to 90 weight percent.

3,953,539
AROMATIC POLYESTER RESIN COMPOSITION HAVING INHIBITED COLORATION AND METHOD FOR INHIBITING COLORATION

Shoji Kawase; Takeo Shima; Hiroo Inata, and Shizuka Kurisu, all of Iwakuni, Japan, assignors to Teijin Ltd., Osaka, Japan

Filed Mar. 25, 1974, Ser. No. 454,605

Claims priority, application Japan, Mar. 28, 1973, 48-34648; Aug. 27, 1973, 48-95118

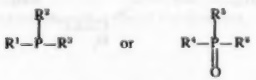
Int. Cl.² C08L *67/00*

U.S. Cl. 260—860 **7 Claims**

1. An aromatic polyester resin composition with inhibited coloration, said composition comprising

1. 100 parts by weight of an aromatic polyester resin derived from a glycol component at least 70 mol % of which consists of tetramethylene glycol and an acid component at least 70 mol % of which consists of an aromatic dicarboxylic acid which are polymerized with a titanium compound catalyst,

2. a 0.01 to 3 parts by weight per 100 parts by weight of the aromatic polyester resin of at least one phosphorus compound which is liquid or solid at room temperature selected from the group consisting of phosphorus compounds of the following formula



wherein each of R^1, R^2 and R^3, and each of R^4, R^5 and R^6 represent a hydrogen atom, an alkyl group containing 1 to 20 carbon atoms, an aryl group containing 6 to 20 carbon atoms, an aralkyl group containing 7 to 20 carbon atoms, or —OR group in which R is a hydrogen atom, an alkyl group containing 1 to 20 carbon atoms, an aryl group containing 6 to 20 carbon atoms, an aralkyl group containing 7 to 20 carbon atoms; R^1, R^2 and R^3, or R^4, R^5 and R^6 may be different from each other, or at least two of R^1, R^2 and R^3 or R^4, R^5 and R^6 may be the same, or at least two of R^1, R^2 and R^3, or R^4, R^5 and R^6 may form a ring,

and metal salts of these phosphorus compounds.

3,953,540
ACRYLONITRILE-CHLORINATED POLYETHYLENE-STYRENE RESINOUS MOLDING COMPOSITIONS CONTAINING ANTIMONY TRIOXIDE

Shoichiro Takezoe, Chigasaki; Masao Ogawa, Tokyo, and Junichi Nakamura, Yokohama, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1974, Ser. No. 473,582

Claims priority, application Japan, Aug. 24, 1973, 48-94280

Int. Cl.² C08L *23/00*

U.S. Cl. 260—878 R **10 Claims**

1. A flame retardant, antistatic, high impact strength resinous molding composition consisting essentially of

A. from 8 to 20 parts by weight of antimony trioxide, and

B. 100 parts by weight of an acrylonitrile-chlorinated polyethylene-styrene ternary resin containing from 25 to 35% by weight of a chlorinated polyethylene having a degree of chlorination of from 30 to 45% by weight obtained by copolymerizing a chlorinated polyethylene, obtained by chlorinating a polyethylene having an average molecular weight of about 50,000, with a mixture of acrylonitrile and styrene to form a graft resin, the ratio of acrylonitrile to styrene being in the range of from 1:99 to 50:50.

3,953,541
PROCESS FOR PREPARATION OF POLYOLEFIN GRAFT COPOLYMERS

Saburo Fuji, Ohtake, Japan, assignor to Mitsui Petrochemical Industries Ltd., Tokyo, Japan

Filed July 17, 1974, Ser. No. 489,249

Claims priority, application Japan, July 20, 1973, 48-81899

Int. Cl.² C08L *23/26;* **C08F** *255/02, 255/08*

U.S. Cl. 260—878 R **17 Claims**

1. A process for preparing a polyolefin graft copolymer, which comprises subjecting a copolymer selected from the group consisting of copolymers of ethylene with diolefins and copolymers of C_3 to C_8 α-olefins with diolefins and containing 2 to 40 double bond per 1000 monomeric units therein and a monomer radical graft-copolymerizable onto said copolymer to a suspension graft copolymerization in the presence of a radical initiator in an inert organic solvent capable of dissolving said radical-polymerizable monomer but incapable of dissolving said graft copolymer and of reacting therewith, at a temperature at which said copolymer is not melted.

3,953,542
PROCESS FOR GRAFTING ETHYLENE ONTO DIENE POLYMERS

Adel Farhan Halasa, Bath, and Richard Gutierrez, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 17, 1974, Ser. No. 515,803

Int. Cl.² C08F *279/02, 257/02*

U.S. Cl. 260—878 R **21 Claims**

1. A process for the grafting of ethylene onto a polymer consisting essentially of 40–100 percent by weight of a conjugated diene and 0–60 percent by weight of an aromatic mono-

mer having no more than 20 carbon atoms selected from the class consisting of vinyl and isopropenyl aryl compounds and derivatives thereof in which the derivative group is an alkyl, aralkyl, cycloalkyl or chlorine attached directly to the aromatic nucleus thereof comprising the steps of maintaining an intimate mixture of ethylene and said polymer at a temperature of −35° to 50° C. in intimate contact with a catalyst composition consisting essentially of:

a. a metal halide compound having the formula $TiBr_nCl_{4-n}$ or VBr_mCl_{5-m} wherein n has a value of 0–4 and m has a value of 0–5;

b. an aluminum hydrocarbon compound having the formula AlR_3 wherein R is a hydrocarbon group having 1–8 carbon atoms selected from the class consisting of alkyl, aryl and cycloalkyl groups; and

c. a carbonyl-containing or thiocarbonyl-containing compound selected from the class consisting of aldehydes, ketones and carboxylic acids, esters, amides and carbamates and the corresponding thiocompounds;

the concentration of said metal halide compound being 1–10 millimoles per 100 grams of said monomer composition, said AlR_3 compound being present in said catalyst composition in a proportion of 0.9–3 moles per mole of said metal halide compound and said carbonyl or thio-carbonyl compound being present in a proportion of 0.5–4 moles per mole of metal halide compound, said grafting reaction being conducted for a period of at least 30 minutes.

3,953,543

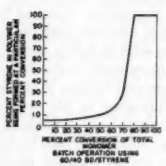
POLYMERIZATION PROCESS AND POLYMER PRODUCED THEREBY

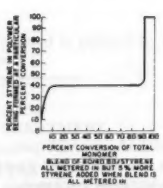
Shingo Futamura, Seville, and Thomas Chester Bouton, Akron, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 26, 1973, Ser. No. 428,269

Int. Cl.² C08G 297/04

U.S. Cl. 260—880 B **21 Claims**




PERCENT CONVERSION OF TOTAL MONOMER
BLEND OF BOUND BD/STYRENE ALL METERED IN BUT 5% MORE STYRENE ADDED WHEN BLEND IS ALL METERED IN

1. A process for preparing butadiene styrene copolymers of improved green strength and low running temperature comprising the steps (a) of polymerizing a mixture of 40–85 percent by weight of butadiene and 15–60 percent by weight of styrene in a hydrocarbon solvent, while the said mixture is fed into the polymerization system containing a lithium-hydrocarbon initiator, at a rate slow enough to effect random copolymerization of at least 10 percent styrene in the resulting polymer backbone, effecting said copolymerization at a temperature in the range of 90°–175° C. to produce a high degree of branching in said copolymer, and (b) effecting the final 10–50 percent of the polymerization with a monomer portion containing a higher proportion of styrene than is incorporated into the polymer backbone, and effecting the formation of block homopolystyrene at the terminals of the branches in said polymer by maintaining 50–100 percent styrene in the monomer portion during the conversion of the final ten percent of monomer to polymer.

3,953,544

LOW TEMPERATURE CURING ADHESIVES

Robert J. Jones, Hermosa Beach; Howard E. Green, Los Angeles, and Robert W. Vaughan, Manhattan Beach, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

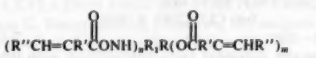
Filed May 10, 1974, Ser. No. 468,705

Int. Cl.² C08F 120/02, 226/00; C07C 69/00, 69/52

U.S. Cl. 526—304 **6 Claims**

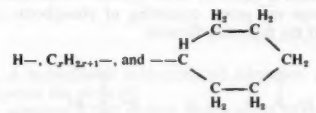
1. An adhesive consisting essentially of a solid polymeric material produced by curing at ambient temperatures:

A. from 10% to 100% by weight of a monomer or monomers having the structure:



$$(R''CH{=}CR'\overset{O}{\overset{\|}{C}}ONH)_xR_1R(O\overset{O}{\overset{\|}{C}}R'C{=}CHR'')_m$$

wherein R'' is selected from the group consisting of



H—, C_rH_{2r+1}—, and —

where x is an integer from 1 to 6; R' is selected from the group consisting of hydrogen and $-C_YH_{2Y}-$, where Y is an integer from 1 to 3; R is selected from the group consisting of alkane radical having 3 to 5 carbon atoms; R_1 is selected from the group consisting of —H, $-C_rH_{2r+1}$, and

where z is an integer from 1 to 3; *m* is an integer from 1 to 3; *n* is an integer from 1 to 2; and $n + m$ is from 3 to 5;

B. from 0% to 5% by weight of a free radical peroxide catalyst; and

C. from 0% to 15% by weight of an organic accelerator.

3,953,545

POLYMERS CONTAINING SILVER AND COPPER

Arthur Stoy, No. 7, Farni ul., Prague 6, Czechoslovakia

Division of Ser. No. 114,088, Feb. 9, 1971, Pat. No. 3,734,897, which is a continuation of Ser. No. 729,897, May 17, 1968, abandoned. This application Mar. 15, 1973, Ser. No. 341,385

Claims priority, application Czechoslovakia, May 25, 1967, 3821-67

Int. Cl.² C08F *13/00*; C12G *1/00*; G03C *1/86*

U.S. Cl. 260—898 **4 Claims**

1. A method for preparing a water-swellable polymeric composition having bound thereto a monovalent metal cation selected from the group of copper and silver which comprises contacting two different kinds of polymers, one polymer carrying nitrile radicals derived from ethylenically unsaturated nitrile monomers and the other of said polymers carrying sulfo radicals derived from ethylenically unsaturated sulfo monomers, with an aqueous solution of a salt of said metal cation for a period of time sufficient to form a complex between the metal ions and said polymeric composition, said solution containing said metal ions in an amount which is at least substantially equivalent to the sulfo groups present.

3,953,546

THIO(DITHIO)PHOSPHORATES

Masachika Hirano, Toyonaka; Kunio Mukai, Nishinomiya, and Hisami Takeda, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

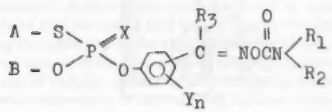
Filed July 11, 1974, Ser. No. 487,670

Claims priority, application Japan, July 31, 1973, 48-86569; Apr. 5, 1974, 49-39319

Int. Cl.² A01N *9/36*; C07F *9/18*

U.S. Cl. 260—938 **8 Claims**

1. Thio (dithio)-phosphorate of the formula,



wherein A represents an alkyl having up to 6 carbon atoms; B represents lower alkyl having up to 4 carbon atoms; Y represents halogen, methoxy or ethoxy; X represents oxygen; R_1 represents alkyl having up to 6 carbon atoms, phenyl, phenyl substituted by halogen or phenyl substituted by lower alkyl having up to 4 carbon atoms; R_2 represents hydrogen or alkyl having up to 6 carbon atoms; R_3 represents hydrogen or alkyl having up to 6 carbon atoms; and *n* represents 0, 1 or 2.

3,953,547

CARBURETOR

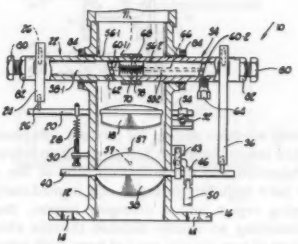
Marthinus Johannes Schoeman, No. 13, 14th Ave., Edenvale, Transvaal, South Africa

Filed Oct. 3, 1973, Ser. No. 403,276

Claims priority, application South Africa, Jan. 8, 1973, 73/0138; Feb. 19, 1973, 73/1163; Apr. 27, 1973, 73/2891

Int. Cl.² F02M *7/22*, *7/16*

U.S. Cl. 261—18 A **4 Claims**



1. A carburetor for an internal combustion engine which includes a duct connectable to a combustible charge inlet of the engine; a vane mounted to be displaceable by airflow through the duct; a butterfly valve within the duct and connectable to a throttle linkage of the engine; a regulating valve extending transversely into the duct and having an outlet directly into the duct, the regulating valve including a first regulating member having a helical groove rotatably displaceable into and out of progressive alignment with the outlet; and at least one control valve, the control valve and the regulating valve being connected in series for controlling and regulating fuel flow from a fuel source and into the duct via the outlet, the regulating valve being controllably operable by the vane dependent on the rate of airflow through the duct and the control valve being linked to the butterfly valve to operate in conjunction with the degree of opening of the butterfly valve, and in which the control valve is in the form of a housing having an inlet connected to the fuel source with a second regulating member in sealing engagement with the inner walls of the housing, the second regulating member having a groove

formed in its periphery to form a restricted passage between the housing inlet and the outlet, and the second regulating member being controllably displaceable to vary the supply of fuel from the housing inlet through the restricted passage to the outlet.

3,953,548

FUEL INJECTION SYSTEM

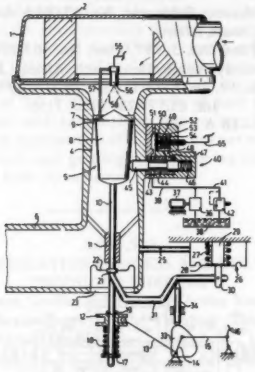
Heinrich Knapp, Leonberg-Silberberg, and Gunther Jaggle, Stuttgart, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 27, 1974, Ser. No. 500,926

Claims priority, application Germany, Sept. 13, 1973, 2346099

Int. Cl.² F02M 7/22

U.S. Cl. 261—50 A **11 Claims**



1. In a fuel injection system for mixture compressing, externally ignited internal combustion engines employing continuous fuel injection into the induction tube of the engine, the induction tube including in series and immediately adjacent, a converging region and a diverging region, the diverging region containing an axially slidable throttle element composed in part of two coaxial conical parts with adjoining bases and different apex angles, the slidable throttle element and the diverging region of the induction tube being positioned to form a minimum annular flow cross section and, downstream thereof, to form a shallow-angled diffuser, and wherein the fuel is injected into the minimum flow cross section, wherein that conical part of the throttle element which converges in the upstream direction has a larger apex angle than the other conical part and wherein the pressures acting on the throttle element are equalized, the improvement comprising:

a. a fuel metering valve assembly means located in the fuel injection system for metering fuel in dependence on the size of said minimum flow cross section and in substantially linear dependence on air flow quantity, including

a control slide which touches that conical part of said throttle element which converges in the direction of air flow and is slidable in its axial direction depending on the position of said throttle element.

3,953,549

FUEL METERING ROD POSITIONING MEANS

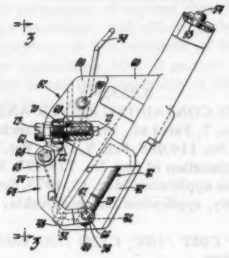
John W. Moulds, Penfield, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 9, 1974, Ser. No. 530,829

Int. Cl.² F02M 7/22

U.S. Cl. 261—50 A **1 Claim**

1. Engine fuel metering means comprising, in combination: a housing defining a fuel supply passage and a metering orifice opening therefrom; a metering rod having an upper end longitudinally movable in the metering orifice and a lower end longitudinally and laterally movable in the fuel supply passage; a positioning link pivotally attached for movement with the lower end of the metering rod; an adjusting lever pivotally mounted on the housing; an adjusting link pivotally connected between the adjusting lever and the lower end of the metering rod, whereby movement of the adjusting lever causes the



lower end of the metering rod to move through a path constrained by the positioning link to include longitudinal movement; an adjusting screw connecting the adjusting lever and the housing for changing the relative position thereof and thus varying the longitudinal position of the metering rod in the orifice, the positioning link being effecting to move the lower end of the metering rod through a path constrained by the adjusting link to further vary the longitudinal position of the metering rod in the orifice.

3,953,550

APPARATUS FOR AERATING LIQUIDS

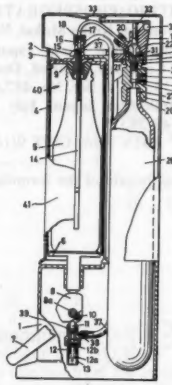
Guy Hugh Gilbey, Empingham, England, assignor to Sodastream Limited, Peterborough, England

Filed Dec. 18, 1974, Ser. No. 533,871

Claims priority, application United Kingdom, Apr. 24, 1974, 17834/74

Int. Cl.² C02D 1/00

U.S. Cl. 261—64 R **7 Claims**

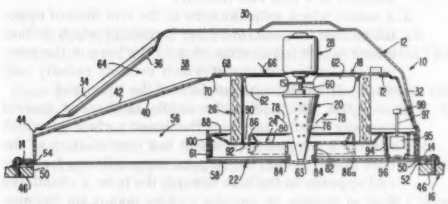


1. Apparatus for aerating liquids comprising:

a. a main body part including a holder for a gas cylinder equipped with a valve;

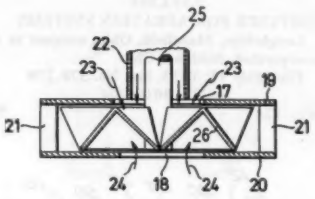
b. actuating means on said body part for actuating said valve and for thereby releasing gas from said cylinder;
c. an aerating head secured to said body for movement between an inserting position in which a vessel can be inserted in said head and an aerating position, an inserted vessel being adjacent said body in said aerating position and remote from said body in said inserting position of the aerating head;
d. connector means on said aerating head and said holder for connecting the valve of a cylinder held by said holder with a vessel inserted in said aerating head for flow of released gas into said vessel;
e. a vessel support movably mounted on said body;
f. cam means on said body part for moving said vessel support toward said inserted vessel in said aerating position and for thereby securing said vessel to said aerating head, and for moving said vessel support away from the inserted vessel and for thereby releasing said vessel from said aerating head; and
g. safety valve means mounted on said body part and communicating with said connector, said cam means including opening means for opening said safety valve means and for thereby releasing gas from an inserted vessel in response to incipient movement of said vessel support away from said vessel and prior to said releasing of the vessel from said aerating head.

3,953,551
AIR COOLING APPARATUS
Arthur G. Dorall, Skyridge, Star Rte. No. 3, Pioneer, Calif. 95666
Filed Jan. 22, 1973, Ser. No. 325,297
Int. Cl.² B01F 3/04
U.S. Cl. 261—91 3 Claims



1. An evaporative air cooler comprising: a housing having an inclined end wall provided with an air inlet and an air outlet therethrough, and a panel in the housing and provided with an inclined surface spaced below and aligned with said air inlet and above and aligned with said air outlet, there being an exit opening between the lower margins of the end wall and said panel and spaced above said air outlet, said inclined surface sloping downwardly and away from the central interior of the housing to permit moisture entering the air opening to strike said inclined surface and to flow downwardly along the same toward and through said exit opening; a rotatable fan mounted in the housing near the upper end of the panel and disposed for creating a flow of air along a path through the housing from the air inlet to the air outlet; a motor within the housing above and coupled with the fan for rotating the same; an open top, relatively shallow water tank disposed in said housing adjacent to said air outlet and spaced below the fan; a baffle covering the open top of the tank, said baffle having an upper surface, a pair of spaced openings through said upper surface, and a pair of radially spaced, continuous projections defining an annular depression in surrounding, spaced relationship of one of the openings, the other opening being outboard of the outer projection, said baffle having a first flange integral therewith and extending downwardly therefrom in alignment with said one opening and into said tank, whereby the first flange forms with the bottom of the tank a first water-receiving cup, and a second flange integral with the baffle and extending downwardly therefrom in alignment with said other opening and into said tank, whereby the second flange forms with the bottom of the tank a second water-receiving cup, each flange having a lower margin provided with a recess therein which cooperates with the bottom of the tank to define a metering hole near the lower extremity of the corresponding cup; a conical, perforate pumping device having an upper enlarged end coupled with the motor and a lower apex end extending through said one opening and into the tank, said device being operable for pumping water upwardly from the tank and through the perforations of the device when the motor is actuated and as the fan directs a flow of air from said air inlet to said air outlet, whereby the air will be cooled by evaporation upon contact with the water elevated by said device; a valve above the baffle and having a float in the other opening, said valve adapted to be coupled to a source of water; and a filter extending upwardly from said baffle to a region adjacent to the top of said panel, said filter having a lower margin in the depression, the baffle having at least one drain hole therethrough in said depression.

3,953,552
AGITATION FLOTATION CELL FOR THE PREPARATION OF MINERALS AND COALS
Werner Strauss, Bochum, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany
Filed Jan. 28, 1975, Ser. No. 544,698
Claims priority, application Germany, Jan. 29, 1974, 2404032
Int. Cl.² B03D 1/18
U.S. Cl. 261—93 6 Claims



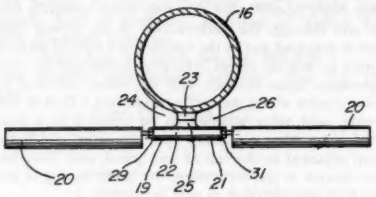
1. An agitator for use in an agitator flotation unit for the preparation of minerals and coals having an agitation shaft with an air supply pipe opening at the lower end of the shaft, comprising:
a vertical shaft;
an air induction agitator unit at the lower end of the shaft having a plurality of axially extending vanes projecting radially outwardly from the shaft and being circumferentially spaced apart a distance less than 180°;
agitator paddles with a paddle between each of the vanes being at an angle to the vanes at an inclined angle relative to the plane of rotation of the shaft with the axial height of the paddles being no greater than the axial height of the vanes.

3,953,553
SEWAGE TREATMENT AERATION SYSTEMS
Paul M. Thayer, Milwaukee, Wis., assignor to Water Pollution Control Corporation, Milwaukee, Wis.
Continuation of Ser. No. 364,585, May 29, 1973, abandoned.
This application Feb. 28, 1975, Ser. No. 554,343
Int. Cl.² B01F 3/04
U.S. Cl. 261—122 9 Claims

1. A prefabricated header-connector assembly adapted for inclusion in a sewage aeration tank by the attachment of a low pressure air supply and diffusers to a plurality of interconnected header-connector assemblies in which said assembly

maintains said attached diffusers in proper alignment in a common plane, said assembly comprises;

a header formed of weldable material capable of having nipples drawn therefrom, a plurality of outwardly projecting nipples drawn from said header at spaced locations on said header,



a plurality of connectors each secured to said header at different ones of said spaced locations, each of said connectors oriented in a transverse direction to the direction of said header, said connectors having coupling means for coupling to diffusers,

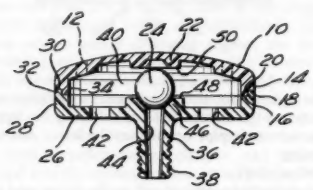
each of said connectors having nipples drawn therefrom with the open end of said connector nipples welded to different ones of said header nipples.

3,953,554

DIFFUSER FOR AERATION SYSTEMS

Edward T. Loughridge, Mansfield, Ohio, assignor to Ashland Vault Incorporated, Ashland, Ohio

Filed July 11, 1973, Ser. No. 378,279
Int. Cl. B01f *3/04*
U.S. Cl. 261—124 **7 Claims**



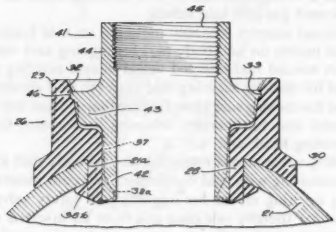
1. A diffuser for submerged gas treatment of a liquid system comprising a body assembly formed of a material which is non-porous and providing vertically spaced horizontally extending top and bottom wall portions cooperating at least in part to define an internal cavity, said bottom portion being formed with a centrally located inlet passage and an upwardly facing valve seat around said passage, said top wall portion being imperforate above said valve seat and providing a plurality of perforations in a pattern laterally around said valve seat, said bottom wall portion having a plurality of cut out openings laterally around said valve seat each having a greater open area than any individual perforation, and normally seated valve means positioned against said valve seat and closing said inlet passage, said valve means being movable under the influence of gas under pressure supplied through said inlet passage to an open unseated position, said body assembly providing means to confine the movement of said valve between said seated and unseated positions.

3,953,555

DIFFUSER CONNECTOR FOR AERATION HEADER

Paul R. Gley, Hillsdale, N.J., assignor to Envirex Inc., Waukesha, Wis.

Filed May 6, 1974, Ser. No. 467,035
Int. Cl.² F16L *19/00;* **B01D** *47/02;* **B05B** *15/00*
U.S. Cl. 261—124 **4 Claims**



2. The combination of a gas diffuser and a connector, said combination comprising:

a. a generally cylindrical base made of an elastic material, said base comprising:

i. a tube the outer surface of which is cylindrical and the inner surface of which defines a bore which has a constriction at a first end thereof,

ii. a saddle which joins the tube at the end thereof opposite to said first end, the inner surface of which defines a bore which is a continuation of the bore in the tube, and the outer surface of which extends radially outwardly from the outer surface of the tube, and

iii. a collar which joins the saddle at the end thereof opposite to the tube and the inner surface of which defines a stepped bore which is a continuation of the bore in the saddle, the stepped bore defining, from the end opposite to the tube towards the tube, a chamfered lead-in section, an annular locking means, an intermediate section, and a shoulder leading to the bore defined by the shoulder and the tube;

b. a generally cylindrical insert made of a rigid material, said insert comprising:

i. a hollow straight stem the outer surface of which is slightly larger in diameter than the inner diameter of the bore defined by the saddle and the tube of said base and the inner surface of which defines a bore for the passage of air and

ii. a hollow enlarged band which joins the stem at a first end thereof, the inner surface of which defines a bore which is a continuation of the bore in the stem, and the outer surface of which has, from the end opposite to the stem towards the stem, an annular locking means adapted to engage the annular locking means on the collar of said base and an intermediate section which is slightly larger in diameter than the inner diameter of the intermediate section of the stepped bore in the collar of said base, the axial distance from the annular locking means on the band on said insert to the end of the stem opposite to the band being sufficient so that, when the annular locking means on the band is engaged with the annular locking means on the collar, the end of the stem opposite to the band is forced axially against the constriction in the tube, causing the first end of the tube to expand to form an external flange; and

c. a gas diffuser connected to said hollow enlarged band.

3,953,556

METHOD OF PREPARING URANIUM NITRIDE OR URANIUM CARBONITRIDE BODIES

Harley A. Wilhelm, Ames, Iowa, and James K. McClusky, Valparaiso, Ind., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation-in-part of Ser. No. 323,185, Jan. 12, 1973, abandoned. This application May 17, 1974, Ser. No. 470,897

Int. Cl.² G21C *21/00*

U.S. Cl. 264—0.5 6 Claims

1. A method of preparing sintered uranium nitride or uranium carbonitride bodies having controlled final carbon-to-uranium ratio in a single furnace comprising:

a. mixing U_3O_8 with a predetermined amount of carbon to prepare a charge, the weight ratio of carbon to U_3O_8 in the charge being determined by the formula $C = 0.1027 + 0.0428X$, where X = atom ratio of carbon with respect to uranium in the final uranium nitride or uranium carbonitride body;

b. compacting the charge into a green body;

c. heating the green body to about 1000°C. until the U_3O_8 in the body is reduced to UO_2;

d. heating the body under reduced pressure to about 1350°C. until the uranium dioxide is converted to UOC or to UOC plus UC;

e. heating the body under a flowing atmosphere of nitrogen to about 1750°C. whereby the UOC is nitrided to uranium nitride; and

f. heating the body to about 1900°C. under reduced pressure whereby excess nitrogen is removed and the body is sintered, thereby forming a sintered uranium nitride or uranium carbonitride body having a controlled final carbon-to-uranium ratio.

3,953,557

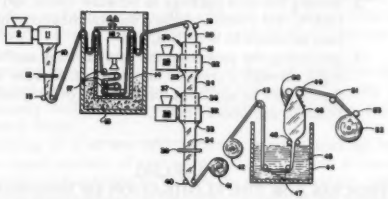
POLYMER FILM WITH NARROW MOLECULAR WEIGHT DISTRIBUTION AND SARAN AND LAMINATES THEREOF

Harri J. Brax; Joseph F. Porinchak, both of Spartanburg, and Alan S. Weinberg, Greenville, all of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 129,501, March 30, 1971, Pat. No. 3,741,253. This application Mar. 22, 1973, Ser. No. 344,005

Int. Cl.² B29D *9/08*

U.S. Cl. 264—22 6 Claims



1. A method for producing a laminate comprising:

A. melt extruding a copolymer of ethylene and vinyl acetate through an annular die to form a first tubulr film, said copolymer having 5 to 20% vinyl acetate and with the number average molecular weight of said copolymer having a coefficient of variation not exceeding 13,

B. irradiating said first film to cross link said copolymer,

C. inflating said first tubular film without causing significant transverse orientation to provide a substantially circular tubing,

D. blending 5 to 40 weight percent of suspension polymerized copolymer of vinylidene chloride and vinyl chloride and 60 to 95 weight percent of emulsion polymerized copolymer of vinylidene chloride and vinyl chloride to form a first blend, the vinyl chloride content of said copolymers being in the range of 5 to 40 percent,

E. blending 2 to 10 weight percent of epoxy resin with said first blend to form a second blend,

F. melt extruding said second blend through a second annular die to form a second tubular film on said irradiated first ply to form a two ply tubular film, said second film providing oxygen barrier properties so that the laminate has an oxygen transmission rate of no more than 70 cc/sq m/24 hrs/1 atm. at 73°F., and

G. melt extruding a third tubular film of a copolymer of ethylene and vinyl acetate through an annular die onto said two ply tubular film and forming a three ply tubular film.

3,953,558

METHOD OF MOULDING FOAMED SYNTHETIC RESIN PELLETS OF POLYOLEFINE

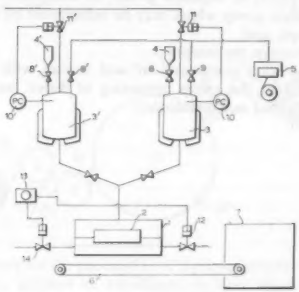
Itaru Hatano, Motoyamanaka; Minoru Hara, Kobe; Tsuneo Kitamura, Ashiya; Akira Ando, and Yasuyuki Suganuma, both of Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1973, Ser. No. 425,870

Claims priority, application Japan, Dec. 19, 1972, 47-128011

Int. Cl.² B29D *27/00*

U.S. Cl. 264—22 18 Claims



1. A method of moulding foamed synthetic resin pellets of polyolefines, comprising the steps of

A. preparing preliminarily foamed synthetic resin pellets of cross-linked polyolefines to more than 65 percent by volume of closed cells;

B. heating the pellets to temperatures up to the melting points of the polyolefin resins and impregnating said pellets with a gas under pressure so that said inorganic gas is contained within said pellets at a pressure of more than 1.18 atmospheres pressure;

C. placing said gas impregnated foamed pellets into a mould having capabilities of enclosing said pellets and allowing escape of gas therefrom; and

D. heating said pellets to cause expansion of said gas to thereby expand said pellets and cause tight adherence to each other and thereby form articles in the shape of said mould.

3,953,559

REVERSE COATING PROCESS USING A LACTAM RELEASE AGENT

Karl-Arnold Weber; Kuno Wagner, and Siegfried Klipfel, all of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

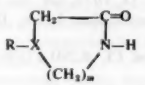
Filed May 3, 1974, Ser. No. 466,755

Claims priority, application Germany, May 19, 1973, 2325577

Int. Cl.² B29D 7/02; B29C 1/04

U.S. Cl. 264—39 9 Claims

9. In a process for reverse coating a substrate with a polyurethane which comprises covering the surface of a release support with liquid release agent, an aqueous solution of a release agent or an aqueous paste of the release agent, heat treating the release agent from about 5 seconds to 10 minutes at 30° to 150°to form a dry tack-free coating, applying a polyurethane coating over the release agent and then removing the coating from the release support, the improvement wherein the release agent is soluble in water, swells in water or forms a paste with water, crystallizes when dried without forming a film, is free from tackiness at temperatures up to 40°C and which is a lactam of the formula



wherein

X represents either a CH group in which case

R represents hydrogen and

m is an integer of between 0 and 9, or

X represents a nitrogen atom, in which case

R represents an aliphatic group, an araliphatic group or a pyridine group which may be substituted by lower alkyl groups, and

m represents the integer 3

or the addition compound of said lactam with a reactant selected from the group consisting of water, an oxime, an amine, alcohol and thioalcohol.

3,953,560

METHOD OF INJECTION MOLDING STRUCTURAL FOAM FOLDING SLAT STRUCTURES

André Klein, Durban, South Africa, assignor to Polycrate (Proprietary) Limited, Pinetown, South Africa

Filed Aug. 28, 1974, Ser. No. 501,228

Claims priority, application South Africa, Sept. 5, 1973, 73/6098

Int. Cl.² B29D 27/00; B29F 1/00

U.S. Cl. 264—50 3 Claims

1. A method of forming a structure comprising longitudinally juxtaposed slats separated by hinge formations to be capable of being folded or rolled, including the steps of introducing a molten synthetic resinous mass containing a foaming agent into a mould, permitting the foaming agent to cause foaming of the mass, and compressing the whole area of the mass with a monolithic ribbed mould plunger in a single step to a predetermined distance above the floor of the mould before the mass solidifies.

3,953,561

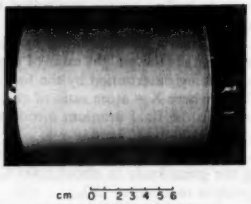
FIRING PROCESS FOR ALUMINA YARN

Hyunkook Shin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 301,504, Oct. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 155,737, June 23, 1971, abandoned. This application Feb. 19, 1975, Ser. No. 551,003

Int. Cl.² F27B 9/14

U.S. Cl. 264—57 4 Claims



1. In a process for producing continuous polycrystalline alumina yarns by extruding through a spinneret having a plurality of orifices to form a continuous multiple filament yarn of continuous filaments a mixture comprising solid particles in an aqueous phase, said solid particles

a. being smaller than 5μ, with at least 98% of the particles by weight being smaller than 3μ as measured for equivalent spherical diameter,

b. having no dimension less than about 0.005μ measured by electron micrograph,

c. being at least 80% by weight alumina, said aqueous phase having dissolved therein at least one basic aluminum salt precursor of alumina; the ingredients being present in such proportions that the solid particles provide between about 35 to 75% by weight of the total available oxides in the mixture; and the amount of alumina available from the solid particles and the precursor of alumina is at least 80% of the total available oxide content of the mixture, the improvement comprising:

1. winding the yarn of freshly extruded multiple filaments, which contain about 30% to about 60% volatiles, onto a collapsible, refractory bobbin to form a shrinkable, continuous filament yarn package,

2. heating the yarn package to between about 300°C. and 1400°C. for a time to reduce the volatiles content of the yarn to about 11% or less, and

3. unwinding the yarn from the yarn package and advancing it through a zone of intense heat, thereby heating the yarn to an apparent temperature of between about 1000°C. and about 1800°C.

3,953,562

PROCESS FOR THE ELIMINATION OF DIMENSIONAL CHANGES IN CERAMIC GREEN SHEETS

Gerald F. Hait, Wappingers Falls, and Robert W. Nufer, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1974, Ser. No. 488,861

Int. Cl.² C04B 35/64

U.S. Cl. 264—63 15 Claims

1. A process for stabilizing a cast, substantially completely dried ceramic green sheet comprising a particulate ceramic and a thermoplastic polymeric binder which comprises contacting said cast ceramic green sheet with a solvent for said thermoplastic polymeric binder for a period of time sufficient to plasticize and soften but not dissolve said thermoplastic polymeric binder, and then again drying the cast ceramic green sheet prior to sintering such ceramic green sheet.

3,953,563

METHOD FOR PRODUCING HIGH ALUMINA REFRACTORY MATERIAL

Per Gudmar Kihlstedt, Bromma, and Knut Sven Eric Forssberg, Stockholm, both of Sweden, assignors to Advanced Mineral Research, Djursholm, Sweden

Continuation-in-part of Ser. No. 130,037, March 31, 1971, abandoned. This application Apr. 24, 1973, Ser. No. 353,972
Claims priority, application Sweden, Apr. 1, 1970, 4505/70
Int. Cl.² C04B 35/64
U.S. Cl. 264—66 7 Claims

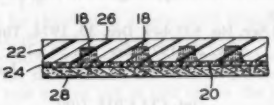
1. A method in the manufacture of high refractory bricks containing more than 50% by weight of non-activated alumina, the method comprising forming a damp mixture of an alumina rich material containing at least 50% by weight non-activated alumina and a binding agent amounting to 5–50% by weight of the total mixture in dry state and comprising finely divided particles of activated alumina, pressing said moist mixture into brick shapes, drying said shapes to prevent crack formation during steam hardening, and steam hardening the shapes at a temperature of about 160°–230°C and a pressure of 5–70 atm for a period of from 1–24 hours until essentially all of the activated alumina has been converted into boehmite.

3,953,564

PROCESS FOR FORMING DECORATIVE SURFACE COVERINGS

Elvin M. Weidman, Willow Street, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed June 28, 1974, Ser. No. 483,971
Int. Cl.² D01F 1/06
U.S. Cl. 264—78 7 Claims



1. A process for producing a thermoplastic resinous decorative surface covering, comprising:

a. depositing a layer of unfused thermoplastic granules of a resinous dryblend onto a releasable substrate,

b. heating said layer to cause partial melting of at least surface portions of the granules at their points of contact,

c. cooling and thereby bonding adjacent granules to form a cohesive, porous layer having an upper and a lower surface,

d. applying in a design to the upper surface of said layer, an amount of a first colored settable resinous ink having a viscosity sufficient to at least partially penetrate said porous layer,

e. applying at least one additional settable resinous ink to the upper surface of said porous layer to cover at least portions of the design formed by the first applied ink, and also at least portions of the upper surface of the porous layer not covered by the first applied ink, said additional ink having a different color than that of said first ink, said inks being applied to penetrate into said porous layer in sufficient amounts so that the ink design is visible from the lower surface thereof after final fusion of all resinous material in said layer,

f. heating said layer for final fusion of all resinous material in the ink-containing porous layer to form a non-porous sheet,

g. cooling said fused sheet, and

h. removing said substrate whereby there is formed a surface covering having a clearly defined in-register, multicolored, decorative design visible from said lower surface of said sheet, which in use becomes the upper surface of said covering.

3,953,565

PROCESS FOR PRODUCING FLAME-RETARDANT SHAPED ARTICLES OF THERMOPLASTIC SYNTHETIC RESINS

Yukio Mizutani; Kazuo Shikata; Shunichi Nakamura, all of Tokuyama, and Michio Yoshimizu, Yamaguchi, all of Japan, assignors to Tokuyama Soda Kabushiki Kaisha, Japan

Filed Oct. 18, 1974, Ser. No. 515,930
Claims priority, application Japan, Oct. 29, 1973, 48-120680; Oct. 31, 1973, 48-121748
Int. Cl.² C08J 3/20
U.S. Cl. 264—210 F 45 Claims

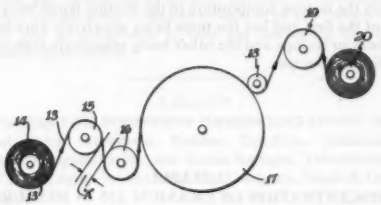
1. A process for producing flame-retardant shaped articles of thermoplastic synthetic resins which comprises: (1) dispersing homogeneously in 100 parts by weight of a thermoplastic synthetic resin 100 – 500 parts by weight of an inorganic metal compound of particle size 0.01 – 500 microns and 0.01 – 500 parts by weight of a surfactant, said inorganic metal compound being one capable of forming a hydrate by reacting with a member of the group consisting of water and an aqueous acid solution; (2) forming the resulting composition into a desired shaped article; and (3) contacting the so obtained shaped article with a liquid selected from the group consisting of water and an aqueous acid solution, thereby converting the inorganic metal compound contained in the shaped article to a hydrate.

3,953,566

PROCESS FOR PRODUCING POROUS PRODUCTS

Robert W. Gore, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Continuation of Ser. No. 39,753, May 21, 1970, abandoned. This application July 3, 1973, Ser. No. 376,188
Int. Cl.² B29D 7/24
U.S. Cl. 264—288 24 Claims



1. A process for the production of a porous article of manufacture of a polymer of tetrafluoroethylene which process comprises expanding a shaped article consisting essentially of highly crystalline poly(tetrafluoroethylene) made by a paste-forming extrusion technique, after removal of lubricant, by stretching said unsintered shaped article at a rate exceeding about 10% per second and maintaining said shaped article at a temperature between about 35°C. and the crystalline melt point of said tetrafluoroethylene polymer during said stretching.

3,953,567

^{82}Sr-^{82}Rb RADIOISOTOPE GENERATOR

Patrick M. Grant; Bruce R. Erdal, and Harold A. O'Brien, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 27, 1974, Ser. No. 509,991
Int. Cl.² C22B 26/10
U.S. Cl. 423—2 2 Claims

1. An improved method of generating ^{82}Rb with a separation factor of at least 10^5 in respect to radioactive ^{82}Sr and having yields of about 80 percent comprising:

a. preparing an ion exchange column resin consisting of a 100–200 mesh resin which is composed of a styrenedivi-

nylbenzene copolymer with attached iminodiacetate exchange groups,

b. charging the said ion exchange column with a basic solution containing ^{82}Sr, and

c. eluting the ^{82}Rb from the said column using a 0.1 molar ammonium hydroxide-ammonium chloride buffered solution.

3,953,568

METHOD OF SIMULTANEOUS CONCENTRATION AND DILUTION OF ISOTOPES

Maomi Seko, 6-5, 2-chome, Ookayama, Meguro, Tokyo, and Hidetake Kakihana, 2-24, 3-chome, Zaimokuza, Kamakura, Kanagawa, both of Japan

Filed July 17, 1972, Ser. No. 272,250

Claims priority, application Japan, July 22, 1971, 46-54210; Sept. 28, 1971, 46-75072; June 13, 1972, 47-58221; June 12, 1972, 47-57636

Int. Cl. C01g *43/00, 53/00, 57/00*

U.S. Cl. 423—7 **18 Claims**

1. Method of simultaneously obtaining separate enriched fractions of heavier and lighter isotopes from isotopic mixtures thereof, which comprises establishing a liquid body containing a mixture in which the isotopes are in the form of coordination complexes of a metal with a ligand, said complexes being present in a plurality of different valent states, alternately passing through a highly cross-linked porous ion exchange resin said body and then an eluant but not a regenerant, thereby forming a plurality of spaced apart isotope-containing bands each about 2 to 1000 cm in width, and as each isotope-containing band leaves the resin collecting it in at least three fractions, the intermediate fraction having approximately the isotope composition of the starting liquid body, and one of the first and last fractions being selectively enriched in the heavier isotope and the other being selectively enriched in the lighter isotope.

3,953,569

CONCENTRATION OF URANIUM 235 IN MIXTURES WITH URANIUM 238 USING ION EXCHANGE RESINS

Maomi Seko, 6-5, 2-chome, Ookayama, Meguro, Tokyo, and Hidetake Kakihana, 2-24, 3-chome, Zaimokuza, Kamakura, Kanagawa, both of Japan

Filed July 17, 1972, Ser. No. 272,251

Claims priority, application Japan, July 22, 1971, 46-54210; Sept. 28, 1971, 46-75072; June 12, 1972, 47-57636; June 13, 1972, 47-58221

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.² B01D *59/30*

U.S. Cl. 423—7 **16 Claims**

1. Method of simultaneously obtaining separate enriched fractions of ^{235}U and ^{238}U from isotopic mixtures thereof, which comprises establishing a liquid body containing a mixture in which the uranium is in the form of U(IV) coordination complexes with a ligand, said complexes being present in a plurality of different valent states, alternately passing through a highly cross-linked porous ion exchange resin said body and then an eluant but not a regenerant, thereby forming a plurality of spaced apart isotope-containing bands each about 2 to 1000 cm in width, and as each isotope-containing band leaves the resin collecting it in at least three fractions, the intermediate fraction having approximately the isotope composition of the starting liquid body, and one of the first and last fractions being selectively enriched in ^{235}U and the other being selectively enriched in ^{238}U.

3,953,570

PROCESS FOR THE TREATMENT OF CARBURIZING SALT WASTES

Wolfgang Müller, Mannheim-Rheinau, and Lothar Witzke, Bruhl, both of Germany, assignors to Th. Goldschmidt AG, Germany

Filed Dec. 30, 1974, Ser. No. 537,448

Claims priority, application Germany, Jan. 4, 1974, 2400318

Int. Cl.² C01F *1/00*

U.S. Cl. 423—155 **2 Claims**

1. A process for the treatment of the reaction mass produced by igniting a dry mixture of barium-containing nitrite-/nitrate-bearing carburizing salt wastes and cyanide-/cyanate-bearing wastes at temperatures above about 150°C,

comprising suspending the reaction mass in water to obtain a suspension containing sodium chloride, alkali carbonate, and alkali nitrite/nitrate as dissolved constituents, and barium carbonate as an undissolved constituent, neutralizizng the alkaline suspension obtained with concentrated nitric acid to a pH value of 6, the feed velocity of the acid and conditions of agitation being so selected that the pH value of the suspension will at no time fall below pH 6, separating the flocculated barium carbonate, concentrating the clear solution obtained to a water content of 10 – °% by weight to precipitate sodium chloride, separating the sodium chloride, and evaporating the residual solution to dryness.

3,953,571

PROCESS FOR THE TREATMENT OF CARBURIZING SALT WASTES

Wolfgang Müller, Mannheim-Rheinau, and Lothar Witzke, Bruhl, both of Germany, assignors to TH. Goldschmidt AG, Germany

Division of Ser. No. 537,449, Dec. 30, 1974. This application Mar. 28, 1975, Ser. No. 563,275

Claims priority, application Germany, Jan. 4, 1974, 2400319

Int. Cl.² C01F *1/00*

U.S. Cl. 423—155 **2 Claims**

1. A process for the treatment of the reaction mass produced by igniting a dry mixture of barium-containing nitrite-/nitrate-bearing carburizing salt wastes and cyanide-/cyanate-bearing wastes at temperatures above about 150°C,

comprising suspending the reaction mass in water to obtain a suspension containing sodium chloride, alkali carbonate, and alkali-nitrite/nitrate as dissolved constituents, and barium carbonate as an undissolved constituent, freeing the alkaline suspension from barium carbonate by filtration, reacting the filtrate with calcium nitrate to precipitate calcium carbonate, separating the calcium carbonate, concentrating the clear solution obtained to a water content of 10 - 20% by weight to precipitate sodium chloride, separating the sodium chloride, and evaporating the residual solution to dryness.

3,953,572

REMOVAL OF BORON FROM $MgCl_2$ BRINES

R. Keith Darlington, Salt Lake City; John Wallace Gwynn, Bountiful, both of Utah, and Stephen H. Hall, Sr., Sun Prairie, Wis., assignors to N L Industries, Inc., New York, N.Y.

Filed Feb. 21, 1975, Ser. No. 551,748

Int. Cl.² C01F *5/30*

U.S. Cl. 423—158 **1 Claim**

1. A method for removing boron from a naturally occurring magnesium chloride brine, wherein said brine is a holding pond brine comprising essentially from 7.0 to 7.6% Mg as $MgCl_2$ and from 400–550 ppm boron, which comprises intimately contacting same with a solid extractant added to said brine to form a slurry, said solid extractant consisting of finely divided, screened oolitic sand which has been calcined between 800° – 950°C for about 24 hours and the amount of said

calcined oolitic sand added to the brine being in the range of from 5 to 25% on a brine weight basis and the mixture maintained at temperatures up to about 100°C and for a period of time from 30 to 60 minutes until the boron is substantially entirely absorbed by said extractant and then maintaining the slurry in a quiescent state to effect gravity separation of the extractant from the purified supernatant brine thus produced.

3,953,573

REMOVAL OF BORON FROM $MgCl_2$ BRINES

Edward O. Kazimir, Pennington, and Donald J. Weintritt, Robbinsville, both of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Feb. 21, 1975, Ser. No. 551,749
Int. Cl.² C01F *5/30;* **C01D** *3/06*
U.S. Cl. 423—161 **6 Claims**

1. Method for removing boron from naturally occurring magnesium chloride brines by solid-liquid extraction comprising: mixing said brine with a solid extractant comprising lignite in particle size range from −40 to +325 mesh at ambient temperature and at a pH in range from about 2 to about 6 for a period of time such that the boron in said brine is absorbed by said extractant and then separating the essentially boron-free brine from said extractant.

3,953,574

PROCESS FOR PURIFYING MOLTEN MAGNESIUM CHLORIDE

Robert D. Toomey, Salt Lake City, Utah, assignor to N L Industries, Inc., New York, N.Y.

Filed Nov. 25, 1974, Ser. No. 526,838
Int. Cl.² C01F *5/32, 5/30;* **C25C** *3/04*
U.S. Cl. 423—178 **5 Claims**

1. Method for chlorinating a spray-dried magnesium chloride salt containing metal oxides, hydroxyl groups and other oxidic contaminants to remove oxygen from said salt comprising: heating the salt in a melt cell to form a molten salt and chlorinating said molten salt in said cell in the presence of finely divided carbon and iron, said chlorination being effected by bubbling chlorine through said molten salt to form, initially, a ferrous iron chloride complex which is rapidly oxidized by additional chlorine to form a ferric iron chloride complex in said molten salt, and maintaining the amount of said ferric iron chloride complex in said molten salt at a level substantially equivalent to at least 0.5% iron, as Fe, on salt weight basis, until said molten salt is substantially free of oxygen content.

3,953,575

IRON OXIDE SORBENTS FOR REGENERATIVE SORPTION OF NO_x

Dimitri Gidaspow, and Linus Leung, both of Chicago, Ill., assignors to American Gas Association, Arlington, Va.

Filed Nov. 21, 1973, Ser. No. 417,829
Int. Cl.² B01D *53/00*
U.S. Cl. 423—212 **3 Claims**

1. A process for the removal of oxides of nitrogen present in small amounts in a gas stream selected from a flue gas stream or an internal combustion engine exhaust stream containing at least 1% oxygen which comprises:

i. contacting, in a sorption step the gas stream with a ferric oxide sorbent supported on a porous alumina support under conditions sufficient to sorb oxides of nitrogen on said sorbent including a temperature of about 0°C to about 350°C,

ii. terminating said sorption step;

iii. thermally regenerating said sorbent at a temperature of about 400°C to about 500°C with an inert gas stream to remove the sorbed oxides of nitrogen and to produce a gas stream containing the sorbed oxides of nitrogen; and

iv. repeating the sorption step.

3,953,576

MAXIMIZING CONVERSION OF NITROGEN OXIDES IN THE TREATMENT OF COMBUSTION EXHAUST GASES

Garbis H. Meguerian, Olympia Fields, Ill., and Yasuo Kaneko, Takatsuki, Japan, assignors to Standard Oil Company, Chicago, Ill. and Mitsubishi Motors Corporation, Japan

Filed Feb. 13, 1974, Ser. No. 442,246
Int. Cl.² B01D *53/00*
U.S. Cl. 423—213.7 **4 Claims**

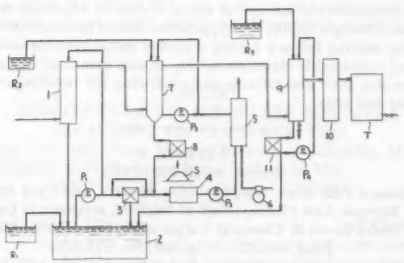
4. In a process for the purification of exhaust gas from the combustion of hydrocarbon materials wherein said exhaust gas is contacted with a nitrogen-oxide-reduction catalyst in a first zone under reducing conditions to reduce nitrogen oxides and to form a nitrogen-oxide-reduced gas and subsequently said nitrogen-oxide-reduced gas is contacted with an oxidation catalyst in a final zone to oxidize carbon monoxide and hydrocarbons, the improvement which comprises introducing a first stream of secondary air providing about 3 volume percent to about 8 volume percent air, based upon the volume of primary air being employed in said combustion, into said nitrogen-oxide-reduced gas to form a first air-gas mixture, said first stream being present in an amount sufficient to enable the ammonia in said nitrogen-oxide-reduced gas to be decreased to a minimum level but insufficient to produce appreciable amounts of nitrogen oxides from ammonia or to enable the hydrocarbons and carbon monoxide in said nitrogen-oxide-reduced gas to be appreciably oxidized, contacting in an intermediate zone said first air-gas mixture with a catalyst for decreasing ammonia to form a gas containing decreased amounts of ammonia, introducing a second stream of secondary air into said gas containing decreased amounts of ammonia to form a second air-gas mixture, and subsequently passing said second air-gas mixture into said final zone, said catalyst for decreasing ammonia comprising nickel and rhodium on a monolithic ceramic support and said second stream of secondary air being sufficient, when added to the oxygen remaining in said gas containing decreased amounts of ammonia, to provide substantially complete oxidation of the carbon monoxide and hydrocarbons in said gas containing decreased amounts of ammonia.

3,953,577

PROCESS FOR PURIFYING GASES CONTAINING HCN

Isami Ooka, Neyagawa; Noboru Tomihisa, Nishinomiya; Yoshio Nogami, Suita, and Katuo Katagiri, Takarazuka, all of Japan, assignors to Osaka Gas Company, Limited, Osaka, Japan

Filed Dec. 27, 1972, Ser. No. 318,749
Claims priority, application Japan, Dec. 30, 1971, 46-1739
Int. Cl.² C01C *3/04, 1/247*
U.S. Cl. 423—236 **14 Claims**



1. In purifying gas containing hydrogen cyanide, hydrogen sulfide and ammonia by subjecting the gas to processes of removing hydrogen cyanide, hydrogen sulfide and ammonia, the improvement characterized in that said process of removing hydrogen cyanide comprises a combination of steps:

1. washing the gas with a suspension of solid sulfur in the presence of a sufficient amount of ammonia to fix hydrogen cyanide as ammonium thiocyanate and ammonium thiosulfate and separating the same from the gas,
2. blowing air into said suspension containing the thiocyanate and the thiosulfate with heating at a temperature of 180° to 230° C to oxidize the thiosulfate and part of the thiocyanate into sulfuric acid and ammonium sulfate, the amount of said air being at least equivalent of the components to be oxidized,
3. contacting said suspension obtained from said step (2) and containing unreacted thiocyanate with an inorganic acid added thereto to decompose it into an ammonium salt of the inorganic acid, and
4. recovering the ammonium salt resulting from said steps (2) and (3).

3,953,578

METHOD FOR PURIFICATION OF INDUSTRIAL FLUE GASES

Pierre Thirion, Poisat, France, assignor to Oxysynthese, Paris, France

Filed Jan. 24, 1973, Ser. No. 326,289
Claims priority, application France, Feb. 4, 1972, 72.03728
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **13 Claims**

1. A method of purification of industrial flue gases and gaseous combustion effluents before their injection to the atmosphere said gaseous effluents containing as impurities especially sulfur dioxide and also oxides of nitrogen, sulphuric acid aerosols and soot, said method comprising essentially the steps of:

saturating said gaseous effluent with water vapor;

extracting the dust from said gaseous effluent;

purifying said gaseous effluent by establishing intimate contact between said gaseous effluent and an aqueous solution of hydrogen peroxide at a temperature of 55°–65°C. to produce sulfuric acid; and

concentrating said sulfuric acid by effecting direct contact between said gaseous effluent in the hot state at 135°–150°C and said liquid sulphuric acid.

3,953,579

METHODS OF MAKING REACTIVE METAL SILICIDE

Robert B. Herchenroeder, Kokomo, Ind., assignor to Cabot Corporation, Kokomo, Ind.

Filed July 2, 1974, Ser. No. 485,117
Int. Cl.² C01F *17/00*
U.S. Cl. 423—263 **12 Claims**

10. A method of making rare earth metal silicides comprising the steps of reacting rare earth metal oxides with at least a stoichiometric amount of metal silicide in which the metal has a stronger affinity for oxygen than silicon has in an electroslag refining furnace having a cooled metal crucible using a non consumable electrode having an end immersed in a molten slag over said mixture and separating the resulting oxide slag and alloy.

3,953,580

BORIC ACID PROCESS

Richard Paul Allen, Kingston-upon-Thames, and Cyril Alfred Morgan, East Molesey, both of England, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Filed Nov. 21, 1974, Ser. No. 525,836
Claims priority, application United Kingdom, Nov. 22, 1973, 54144/73
Int. Cl.² C01B *35/10*
U.S. Cl. 423—283 **7 Claims**

1. In the process for the continuous production of boric acid which comprises the reaction of borate-containing ore with sulfuric acid in aqueous medium, separation of the resultant boric acid from the mother liquor by crystallization and recycling of the mother liquor to the process as solvent for subsequent quantities of borate ore, the improvement which comprises passing said recycling mother liquor through a porous permselective cellulose acetate membrane which has been annealed at low temperatures and having a low boron rejection level thereby removing impurities from the liquor, and recycling the permeate to said process.

3,953,581

PURIFICATION OF WET-PROCESSED PHOSPHORIC ACID USING ANHYDROUS SOLVENTS

Klaus Peter Ehlers, Hurth-Knapsack; Wolfgang Scheibitz, Leverkusen, and Gero Heymer, Erftstadt Liblar, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 24, 1974, Ser. No. 463,531
Claims priority, application Germany, Apr. 30, 1973, 2321751
Int. Cl.² C01B *25/16*
U.S. Cl. 423—321 S **15 Claims**

1. In a process for the purification of contaminated wet-processed phosphoric acid, wherein the wet-processed phosphoric acid is mixed in a mixing zone with at least one organic solvent in which water is partially soluble and which dissolves phosphoric acid, the organic phosphoric acid solution obtained is separated from a remaining residue, the dissolved phosphoric acid is recovered from the said organic phosphoric acid solution and the organic solvent freed from phosphoric acid is recycled, the improvement which comprises mixing in the mixing zone aqueous wet-processed phosphoric acid having free phosphoric acid and free water therein with the organic solvent, said organic solvent having a region completely miscible of the three components water, phosphoric acid and organic solvent which lies between the phosphoric acid - organic solvent axis and the binodal curve in a ternary diagram of said three components, said organic solvent being anhydrous and used in a quantity of at least that necessary to dissolve (a) the free phosphoric acid and (b) the free water, with the resultant formation of a single liquid phase and recovering the free phosphoric acid from the said organic phosphoric acid solution by extraction with water in an extraction zone; removing the water from the organic solvent and recycling the resulting anhydrous organic solvent to the mixing zone.

3,953,582

PROCESS FOR THE SEPARATION OF SODIUM AZIDE

Peter John Astrauskas, Montreal; Guy Michel Blondin, Beloeil; Roland Picard, and Carl Fredrik Rigg, both of McMasterville, all of Canada, assignors to Canadian Industries, Ltd., Montreal, Canada

Filed Mar. 21, 1975, Ser. No. 560,732
Claims priority, application Canada, Apr. 24, 1974, 198458
Int. Cl.² C01B *21/08*
U.S. Cl. 423—410 **5 Claims**

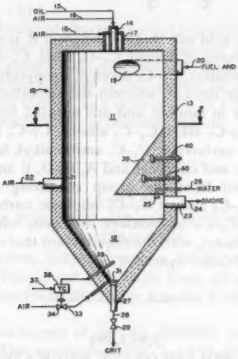
1. An improved process for the separation of basic alkali metal azide particles suspended in an alkali metal azide/liquid ammonia solution comprising the steps of bringing said suspension of basic alkali metal azide particles into contact with a non-reactive, immiscible mineral oil of density greater than the density of said solution, permitting said mineral oil and said solution to separate to form an interface whereby said suspended basic alkali metal azide particles traverse said interface and enter into suspension in the said mineral oil, separating said liquid ammonia/azide solution and said basic azide-containing mineral oil, and recovering from said mineral oil the said basic alkali metal azide particles.

3,953,583

GRIT REMOVAL FROM CARBON BLACK

Eulas W. Henderson, Oregon, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 28, 1974, Ser. No. 473,729
Int. Cl.² C09C 1/50
U.S. Cl. 423—450 3 Claims



1. In the production of carbon black in a generally vertically extending reactor in which a feed oil is introduced into the top of the reactor and flows downwardly, and combustion gases are introduced into an upper region of the reactor to supply heat to the oil to decompose the oil to form carbon black; the method of removing grit from the carbon black which comprises introducing a stream of air into a lower region of the reactor in an upwardly extending direction to entrain carbon black while permitting the grit to pass downwardly, removing the downwardly passing grit through a first opening in the bottom of the reactor, and removing combustion gases and carbon black through a second opening in the reactor spaced upwardly from said first opening.

3,953,584

PROCESS FOR THE PREPARATION OF BASIC ALUMINUM CHLORIDES

Max Danner, and Martin Krieg, both of Gersthofen, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 21, 1974, Ser. No. 444,539
Claims priority, application Germany, Feb. 27, 1973, 2309610
Int. Cl.² C01F 7/56
U.S. Cl. 423—462 5 Claims

1. A process for the preparation of aqueous solutions of basic aluminum chlorides of the formula $Al_2(OH)_nCl_z$, where $0<n<4$ and $6>z>2$, $n + z$ being always 6, by reaction of hydrochloric acid with an aluminum hydroxide, which comprises preparing in a first step at a temperature of from 80° to 120° C an $AlCl_3 \cdot 6\ H_2O$ suspension having a concentration in the range of from 278 to 385 milligrams of chloride per gram suspension, from 36 – 55 weight % hydrochloric acid and the equimolar amount of an aluminum hydroxide or hydrated aluminum oxide of such a kind which is soluble in hydrochloric acid only at a temperature above 80° C until a sample of the reaction mixture upon dilution with water gives a clear solution, subsequently reacting this $AlCl_3 \cdot 6\ H_2O$ suspension in a second step at a temperature of from 100° to 150° C with an excess of the same aluminum hydroxide or hydrated aluminum oxide until the required stoichiometric composition is formed, whereupon the reaction mixture is stirred with the 1 – 5-fold volume of cold water in order to precipitate the excess of aluminum hydroxide and separating the non-converted aluminum hydroxide.

3,953,585

MANUFACTURE OF OXYGEN DIFLUORIDE

Bernard Sukornick, Elizabeth, N.J., assignor to Allied Chemical Corporation, New York, N.Y.

Filed Dec. 27, 1960, Ser. No. 78,766
Int. Cl.² C01B 9/08
U.S. Cl. 423—489 10 Claims

1. The process for making oxygen difluoride which comprises subjecting alkali metal hyponitrite containing 2–5 oxygen atoms, at temperature not substantially above 40° C., to the action of elemental fluorine in quantity and for a time sufficient to effect reaction of the fluorine with a substantial amount of hyponitrite to form a substantial quantity of oxygen difluoride, and recovering oxygen difluoride.

3,953,586

PROCESS FOR PURIFYING GASES CONTAINING H_2S

Waichi Tanimura, No. 836, Okazu-cho, Tozuka, Yokohama, Kanagawa, Japan

Filed Dec. 5, 1973, Ser. No. 421,928
Claims priority, application Japan, Dec. 15, 1972, 47-125153
Int. Cl.² C01B 17/04
U.S. Cl. 423—575 3 Claims

1. A process for preparing sulfur by continuously removing sulfur compounds from a fuel gas stream containing H_2S or H_2S and a small quantity of SO_2, which comprises (1) bringing into contact a fuel gas stream containing H_2S with a stream of organic solvent that dissolves H_2S and SO_2 well, so as to remove the H_2S and SO_2, if present, from said gas stream (2) mixing most or all of the solvent stream discharged from step (1) and a stream of organic solvent containing SO_2, the amount of SO_2 contained in said solvent being stoichiometrically less than that of H_2S in the mixed solvent, under reaction conditions so selected as to produce elemental sulfur and a stream of organic solvent containing dissolved unreacted H_2S, and retaining the mixed streams for a time sufficient to insure that substantially no unreacted SO_2 remains within the stream of organic solvent; (3) separating the solvent stream containing dissolved H_2S of step (2) from the elemental sulfur; (4) separating the organic solvent stream containing dissolved H_2S from step (3) into a stream of gas containing H_2S and a stream of organic solvent free of H_2S and returning a part of said organic solvent stream free of H_2S to step (1); (5) oxidizing the gas stream containing H_2S from step (4) under oxidizing conditions so as to produce SO_2; and (6) contacting the gas stream containing SO_2 from the step (5) with a part of the organic solvent free of H_2S from step (4) to produce a stream of purified gas free of SO_2 and a stream of organic solvent containing dissolved SO_2 which solvent stream is returned to step (2).

3,953,587

ZEOLITE CATALYST FOR DILUTE ACID GAS TREATMENT VIA CLAUS REACTION

Hanju Lee, and Chang Whan Chi, both of Columbia, Md., assignors to W. R. Grace & Co., Columbia, Md.

Filed Nov. 27, 1974, Ser. No. 527,620
Int. Cl.² C01B 17/04
U.S. Cl. 423—576 10 Claims

1. A method of decreasing contaminant sulfurous gases consisting of sulfur oxides and hydrogen sulfide from process effluent gas streams containing less than about 5 volume percent of said sulfurous gases comprising contacting said gas stream with a zone containing a sodium exchanged hydrogen zeolite adsorbent-catalyst at a temperature of about 400°F to 700°F whereby said sulfurous gases are converted to elemental sulfur; continuing contact of said gas stream until said zeolite is substantially loaded with said contaminant sulfurous

substances; interrupting the flow of said gas stream; heating said zeolite adsorbent to a temperature of about 800°F to 1000°F to volatilize and remove sulfur from said zeolite, thereby regenerating said zeolite; and repeating the step of contacting said gas stream with said zeolite thereby providing for cyclic operation of the process.

3,953,588

PROCESS FOR THE PRODUCTION OF ALLERGEN-CONTAINING EXTRACTS

Otto Nieschulz, Hamburg; Günther Rüdiger, Reinbek, and Jürgen Maas, Kroeppelshagen, all of Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

Filed Dec. 5, 1973, Ser. No. 421,791

Claims priority, application Germany, Dec. 11, 1972, 2260455; Oct. 20, 1973, 2352724

Int. Cl.² A61K *39/00, 39/36*

U.S. Cl. 424—12 **6 Claims**

1. In a process for preparing an allergen extract which includes extracting an allergen-containing material with a hydrophilic aqueous or aqueous alcoholic allergen solvent and recovering water-soluble allergens from said material, the improvement which comprises, prior to said extracting step:

pre-extracting an allergen-containing material having a plurality of allergens, a portion of which is more lipophilic in character than the remainder, with a lipophilic solvent consisting essentially of an aqueous solution of a neutral, water-soluble cyclic ether having a boiling point below 105° C. which is at least one member selected from the group consisting of tetrahydrofuran, tetrahydropyran and dioxane to extract said lipophilic portion.

3,953,589

METHOD FOR PROTECTING HUMAN SKIN FROM ULTRAVIOLET RADIATION

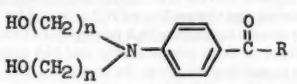
Paul L. Warner, Jr., Clarence, N.Y., assignor to Westwood Pharmaceuticals, Inc., Buffalo, N.Y.

Continuation of Ser. No. 351,398, April 16, 1973, abandoned. This application Sept. 27, 1974, Ser. No. 509,997

Int. Cl.² A61K *7/44*

U.S. Cl. 424—60 **7 Claims**

1. A method for protecting human skin from the erythemic effect of ultraviolet radiation which comprises applying to the skin a compound having the formula



wherein *n* is an integer of from 1 to 3 and R is an alkyl group having from 2 to 16 carbon atoms, said compound being applied in an amount sufficient to screen out substantially all of the radiation having a wave length between about 297nm and 320nm.

3,953,590

COMPOSITION AND METHOD FOR INHIBITING PERSPIRATION WITH S-SUBSTITUTED BENZOTHIOHYDROXIMIC ACID AND SALTS THEREOF

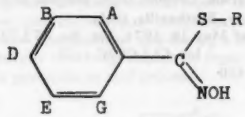
Miriam Lois Douglass, Bound Brook, and Salvatore Joseph DeSalva, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 107,476, Jan. 18, 1971, abandoned. This application Mar. 29, 1973, Ser. No. 346,068

Int. Cl.² A61K *7/32*

U.S. Cl. 424—65 **12 Claims**

1. A method for inhibiting perspiration which comprises applying to the active sites from which perspiration is excreted one microgram to 0.1 gram of a perspiration-inhibiting S-substituted benzothiohydroximic acid of the formula:



or a hydrohalic acid salt thereof, wherein R is selected from the group consisting of phenyl, C_1–C_9 alkyl, C_1–C_9 hydroxyalkyl, C_1–C_9 aminoalkyl, C_1–C_9 alkenyl, oxopyridyl, and substituted derivatives thereof, wherein the substituents on R are limited to three in number and are selected from the group consisting of C_1–C_7 alkyl, C_1–C_7 alkoxy, C_1–C_7 hydroxyalkyl, C_1–C_7 aliphatic carboxylic, C_1–C_7 amino-alkyl, halogen, nitro, hydroxy, amino and carboxyl and A, B, D, E and G are individually selected from the group consisting of hydrogen, C_1–C_7 alkyl, C_1–C_7 alkoxy, C_1–C_7 aliphatic carboxylic, C_1–C_7 hydroxyalkyl, C_1–C_7 aminoalkyl, halogen, nitro, hydroxy, amino, and carboxyl, with the requirement that at least two of A, B, D, E and G are hydrogen.

3,953,591

FATTY ACID, POLYSILOXANE AND WATER-SOLUBLE POLYMER CONTAINING SKIN CONDITIONING EMULSION

William Earl Snyder, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 29, 1974, Ser. No. 464,884

Int. Cl.² A61K *7/78*

U.S. Cl. 424—80 **9 Claims**

1. A skin conditioning emulsion composition comprising:

A. a fatty acid or a mixture of fatty acids having an average carbon chain length of 10 to 31 carbon atoms wherein from about 20% to about 80% of the acid groups are neutralized;

B. a polysiloxane fluid having the formula — $[R_2SiO]$ — wherein R is C_1–C_4 alkyl or phenyl and wherein said polysiloxane has a viscosity at 25°C. of from about 5 to about 2,000 centistokes;

C. a water-soluble polymer having a molecular weight of about 500 to about 5,000,000 selected from the group consisting of quaternary ammonium substituted cellulose ether derivatives, hydroxyethyl cellulose, hydroxypropyl cellulose, a polymer of acrylic acid crosslinked with from 0.75% to 2.00% of a crosslinking agent selected from the group consisting of polyallyl sucrose and polyallyl pentaerythritol, methyl cellulose, sodium carboxymethyl cellulose, polyvinyl pyrrolidone, polyvinyl alcohol and polyvinyl methyl ether maleic anhydride; and

D. water.

3,953,592

LIVE INFLUENZA VIRUS VACCINES AND PREPARATION THEREOF

Julien Peetermans, Rixensart, Belgium, assignor to Recherche et Industrie Therapeutiques (R.I.T.), Belgium

Filed Sept. 27, 1973, Ser. No. 401,335

Int. Cl.² A61K *39/12*

U.S. Cl. 424—89 **8 Claims**

1. An attenuated influenza virus vaccine effective on intranasal administration comprising an effective amount of a serum inhibitor-resistant strain of influenza A virus obtained by passaging in the allantoic cavity of embryonated eggs a recombinant strain obtained from H_3N_2 influenza and A/PR_8 influenza, which strain is sensitive to serum inhibitors, said passaging being made in the presence of serum until a serum inhibitor resistant strain is obtained, and a carrier therefor.

3,953,593

ANTIBACTERIAL COMPOSITIONS

Martin Cole, and Robert Sutherland, both of Dorking, England, assignors to Beecham Group Limited, Great Britain

Filed Sept. 13, 1974, Ser. No. 505,741

Claims priority, application United Kingdom, Sept. 28, 1973, 45504/73

Int. Cl.² A61K *35/00*

U.S. Cl. 424—114 7 Claims

1. An antibacterial pharmaceutical composition which comprises an antibacterially effective amount of a mixture of 2-isopropoxynaphth-1-yl pencillin, or a physiologically acceptable salt thereof, and cephaloridine, or a physiologically acceptable salt thereof, in a ratio of 2:1 to 1:2 in combination with a pharmaceutically acceptable vehicle.

3,953,594

PROCESS FOR PREPARING BLEOMYCIN GROUP ANTIBIOTICS

Hamao Umezawa, Tokyo; Tomohisa Takita, Asaka; Yasuhiko Muraoka, Tokyo, and Akio Fujii, Yono, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai, Tokyo, Japan

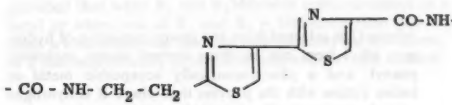
Continuation-in-part of Ser. No. 280,043, Aug. 11, 1972, abandoned. This application Aug. 7, 1973, Ser. No. 386,329

Claims priority, application Japan, Aug. 13, 1971, 46-61063

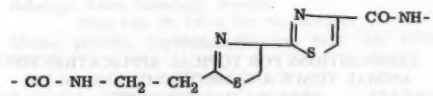
Int. Cl.² H61K *35/00*

U.S. Cl. 424—117 1 Claim

1. A process for preparing stable bleomycin group antibiotics having the partial structure



which comprises oxidizing the corresponding phleomycin group antibiotic having the partial structure



with potassium ferricyanide or manganese dioxide at 0° to 50°C, for 20–240 hours at pH 6.5 – 9, employing 1 –50 moles of oxidizing agent per mole of phleomycin group antibiotic, said phleomycin group antibiotic being selected from the group consisting of phleomycin D_1, E, G, a mixture thereof, 3-S, S-dimethylmercaptopropylamino-phleomycin, 3-morpholinopropylamino-phleomycin, 3-N, N-dimethylamino-propylamino-phleomycin and YA-56 and separating the stable bleomycin group antibiotic.

3,953,595

SUBSTITUTED BENZOIC ACID HYPOLIPEMIC AGENTS

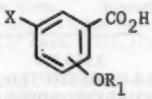
Gerald Fagan Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 304,528, Nov. 7, 1974, which is a division of Ser. No. 155,209, June 21, 1971. This application May 3, 1974, Ser. No. 466,774

Int. Cl.² A61K *31/19*

U.S. Cl. 424—230 2 Claims

1. A method for reducing blood lipid levels which comprises administering to a hyperlipemic mammal a hypolipemic effective amount of a compound selected from the group consisting of



and the pharmaceutically acceptable salts thereof wherein

X is selected from the group consisting of fluorine, chlorine, bromine, methyl, methoxy and trifluoromethyl and

R_1 is acylmethyl of the formula

wherein R is selected from the group consisting of alkyl having from 1 to 4 carbon atoms and phenyl.

3,953,596

8-OXA-3-AZABICYCLO(3.2.1)OCTANE ANALGESIC COMPOSITIONS AND METHOD OF ALLEVIATING PAIN IN ANIMALS

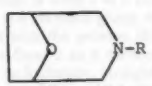
Alfred D. Miller, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Division of Ser. No. 370,011, June 14, 1973, Pat. No. 3,856,783. This application July 12, 1974, Ser. No. 487,924

Int. Cl.² A61K *31/535*

U.S. Cl. 424—248 14 Claims

1. An analgesic composition comprising a pharmaceutical carrier and an analgesically effective amount of a compound represented by the formula



wherein R is a radical selected from the group consisting of benzyl; phenyl; aminoalkyl (C_1 to C_6); dimethylaminoalkyl (C_1 to C_6); phenylacetyl; quinoxaloyl; mono-, di-, or tri-alkoxy (C_1 to C_4) substituted benzoyl; phenylalkyl where the alkyl constituent thereof contains from 1 to 4 carbon atoms; alkenyl (C_3); mono-, di-, or tri-halogen substituted phenylalkyl where the alkyl group contains from 1 to 4 carbon atoms and the halogen is substituted on the phenyl ring; guanadinoalkyl (C_1 to C_4); mono-, di-, or tri-halogen substituted benzoyl; di- or tri-alkyl (C_1 to C_4) substituted benzoyl; mono-, di-, or tri-halogen substituted phenylalkanoyl wherein the alkanoyl group contains from 2 to 4 carbon atoms and the halogen is on the phenyl ring; hexahydrobenzoyl; phenylalkenoyl wherein the alkenoyl group is a lower alkenoyl containing from 3 to 5 carbon atoms; phenylalkanoyl wherein the alkanoyl group contains from 2 to 4 carbon atoms; o- and p-alkyl (C_1 to C_4) substituted phenylalkanoyl where the alkanoyl group contains 2 to 4 carbon atoms and the alkyl group is substituted on the phenyl ring; alkyl (C_1 to C_4) substituted naphthylalkanoyl wherein the alkanoyl group contains 2 to 4 carbon atoms and the alkyl group or groups are attached to the naphthyl ring;

alkanoyl (C_4 to C_{18}); haloalkyl (C_1 to C_4) mono-, di-, or tri-substituted benzoyl wherein the haloalkyl group contains from 1 to 5 halogen atoms; mono-, di-, or tri-alkoxy (C_1 to C_4) substituted phenylalkyl wherein the alkyl group contains 1 to 4 carbon atoms and the alkoxy is substituted on the phenyl ring; thienylalkyl wherein the alkyl group contains from 1 to 4 carbon atoms; anilinocarbonyl; adamantanecarbonyl; phenylsulfonyl; mono- or di-carboxyl substituted benzoyl; mono- or di-hydroxyl substituted benzoyl; nicotinoyl; mono- or di- alkanoyloxy (C_2 to C_4) substituted benzoyl; thenoyl; phenylglyoxylyl; cycloalkyl (C_4 to C_8); N-(alkylene α,ω-dicarbonyl)-8-oxa-3-azabicyclo(3.2.1)octane; N-(alkylene-8-oxa-3-azabicyclo(3.2.1)octane; and N-(terephthaloyl)-8-oxa-3-azabicyclo(3.2.1) octane; or the pharmacologically acceptable acid addition salts thereof.

3,953,597

USE OF 6-AMINO-9-(SUBSTITUTED BENZYL)PURINES AND THEIR CORRESPONDING N¹-OXIDES AS COCCIDIOSTATS

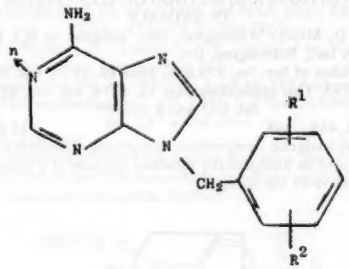
Emil P. Lira, Des Plaines; Walter M. Barker, Mundelein, and Robert C. McCrae, Lake Zurich, all of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.

Division of Ser. No. 219,848, Feb. 4, 1972, Pat. No. 3,846,426, which is a continuation-in-part of Ser. No. 120,781, March 3, 1971, abandoned. This application Aug. 9, 1974, Ser. No. 496,027

Int. Cl.² A61K *31/52*

U.S. Cl. 424—253 **43 Claims**

1. A medicated feed composition for treating coccidiosis comprising a poultry feed ration containing an effective minor amount of a compound of the structural formula:



wherein *n* is 0 or 1, and R^1 and R^2

a. individually are of the group consisting of hydrogen, halogen, nitro and trihalomethyl, provided that at least one of R^1 and R^2 is other than hydrogen, not more than one of R^1 and R^2 is of the group consisting of nitro and trihalomethyl, and R^1 and R^2 are located in the 2 and 6 positions on the carbocyclic portion of the compound, or

b. are both methyl and are located in the 3 and 4 positions on the carbocyclic portion of the compound.

3,953,598

COMPOUNDS, COMPOSITIONS AND METHODS OF USE

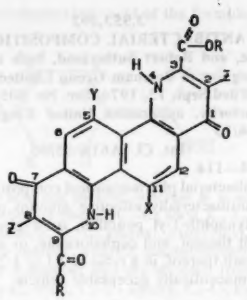
Charles M. Hall, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 287,425, Sept. 8, 1972, Pat. No. 3,838,132. This application Sept. 23, 1974, Ser. No. 508,788

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **9 Claims**

1. A pharmaceutical composition, useful for the prophylaxis of asthma or rhinitis symptoms, which comprises an anti-asthma or anti-rhinitis effective amount of a compound of the formula



wherein

R is selected from the group consisting of hydrogen, alkyl from one to three carbon atoms, inclusive; phenyl, and a pharmaceutically acceptable metal or amine cation;

Z is selected from the group consisting of hydrogen, alkyl from one to three carbon atoms, inclusive; and phenyl;

X and Y are the same or different monosubstituents and when X and Y are different monosubstituents, one monosubstituent is hydrogen and the other monosubstituent is selected from the group consisting of alkyl from one to three carbon atoms, inclusive; alkoxy from one to three carbon atoms, inclusive; phenyl; halogen; hydroxy; nitro; trifluoromethyl; cyano; amino; carboxyamide; and

where Q is selected from the group consisting of hydrogen, alkyl from one to three carbon atoms, inclusive; phenyl, and a pharmaceutically acceptable metal or amine cation with the proviso that where R is hydrogen or a pharmaceutically acceptable metal or amine cation; then Q is the same as R; and

when X and Y are the same monosubstituent, they are selected from the group consisting of hydrogen, chlorine, bromine, and methoxy

in association with a pharmaceutical carrier.

3,953,599

COMPOSITIONS FOR TOPICAL APPLICATION TO ANIMAL TISSUE AND METHOD OF ENHANCING PENETRATION THEREOF

Francis S. Kilmer MacMillan, and Warren I. Lyness, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 489,649, July 18, 1974, Pat. No. 3,903,256, which is a division of Ser. No. 224,356, Feb. 7, 1972, Pat. No. 3,839,566, which is a division of Ser. No. 48,655, May 17, 1970, Pat. No. 3,678,156, which is a division of Ser. No. 595,427, Nov. 18, 1966, Pat. No. 3,527,864, which is a continuation-in-part of Ser. No. 344,195, Feb. 12, 1964, abandoned. This application Jan. 17, 1975, Ser. No. 541,901

Int. Cl.² A61K *7/32*

U.S. Cl. 424—265 **3 Claims**

1. A composition for application to animal tissue comprising a safe and effective amount of a anticholinergic scopol-

amine ester compound and from about 0.1% to about 10.0% of an aliphatic sulfoxide selected from the group consisting of octyl methyl sulfoxide, nonyl methyl sulfoxide, decyl methyl sulfoxide, undecyl methyl sulfoxide, dodecyl methyl sulfoxide, 2-hydroxydecyl methyl sulfoxide, 2-hydroxyundecyl methyl sulfoxide, and 2-hydroxydodecyl methyl sulfoxide.

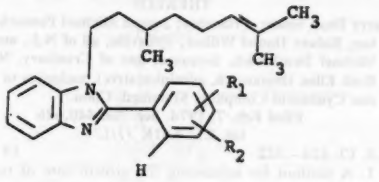
3,953,600

CITRONELLYL BENZIMIDAZOLES

William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 534,684, Dec. 20, 1974, abandoned. This application Aug. 21, 1975, Ser. No. 606,364
Int. Cl.² C07D 235/18
U.S. Cl. 424—273 13 Claims

1. A compound of the formula



where

R_1 and R_2 each independently represent hydrogen, halo having an atomic weight of about 19 to 36, lower alkyl having 1 to 4 carbon atoms, lower alkoxy having 1 to 4 carbon atoms, trifluoromethyl, or

R_1 and R_2 on adjacent carbon atoms together represent methylenedioxy,

provided that when R_1 and R_2 are both trifluoromethyl or t-butyl or when one of R_1 and R_2 is trifluoromethyl and the other is t-butyl they are on other than adjacent carbon atoms; or a pharmaceutically acceptable acid addition salt thereof.

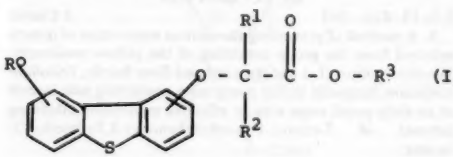
3,953,601

DIBENZOTHIOPHENE DERIVATIVES AS SERUM LIPID LOWERING AGENTS

Ulf Goran Bondesson, Huddinge; Salo Schmul Gronowitz, Lund; Nils Erik Stjernstrom, Sodertalje, and Tage Rolf Gunnar Svensson, Lund, all of Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden

Filed Feb. 28, 1974, Ser. No. 446,621
Claims priority, application Sweden, Mar. 16, 1973, 7303673
Int. Cl.² A61K 31/38
U.S. Cl. 424—275 10 Claims

1. A method for the treatment of excessive serum lipid concentrations in mammals comprising administering orally to a mammal in need thereof a therapeutically effective amount of a dibenzothiophene derivative having the formula



(I)

in which formula R^0 is selected from the group consisting of H, F, Cl, Br and OCH_3; R^1 and R^2 are the same or different and are selected from the group consisting of H and alkyl having 1–3 carbon atoms; R^3 is selected from the group consisting of H and alkyl having 1–3 carbon atoms; R^0 and the side chain containing the radicals R^1, R^2 and R^3 being on the same or different benzene ring.

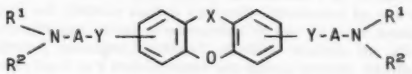
3,953,602

PHARMACEUTICALLY USEFUL OXYGEN CONTAINING HETEROCYCLIC DERIVATIVES

Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 15, 1973, Ser. No. 370,423
Int. Cl.² A61K 31/35, 31/34
U.S. Cl. 424—283 9 Claims

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a compound selected from the formula



wherein X is selected from a bond, —CH_2—, or carbonyl; each Y is selected from a vinylene group,

carbonyl, oxygen, divalent sulfur, or carbonyloxy, with the proviso that when Y is a vinylene group or

X is other than carbonyl; A is selected from a straight or branched alkylene chain of from 1 to 6 carbon atoms with the proviso that when Y is a vinylene group A contains from 1 to 5 carbon atoms, and with the proviso that when Y is a carbonyloxy, A contains from 2 to 6 carbon atoms; each of R^1 and R^2 is selected from hydrogen, straight or branched lower alkyl of from 1 to 4 carbon atoms, or alkenyl of from 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position; and pharmaceutically acceptable acid addition salt thereof, in an amount effective to suppress delayed hypersensitivity.

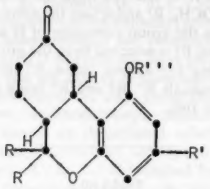
3,953,603

HEXAHYDRO-DIBENZO[B,D,]PYRAN-9-ONES AS PSYCHOTROPIC, PARTICULARLY ANTI-DEPRESSANT DRUGS

Robert A. Archer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 413,009, Nov. 5, 1973. This application May 1, 1975, Ser. No. 573,500
Int. Cl.² A61K 31/35
U.S. Cl. 424—283 7 Claims

1. A process for treating mammals suffering from depression which comprises administering to a mammal in need of such treatment a dose of a compound represented by the formula



wherein R′ is either C_7–C_{10} normal alkyl or is the group

wherein R″ is C_5–C_7 alkyl and R‴ is H or methyl, wherein both R groups are identical and are H or methyl and wherein R′′′ is H or C_1–C_4 alkanoyl, in an amount effective to treat depression.

3,953,604

1-(2-SUBSTITUTED-CHROMONYLOXY)-2-HYDROXY-3-(SUBSTITUTED PHENOXY)PROPANES

Brian Thomas Warren, Ickenham, and John William Spicer, London, both of England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

Division of Ser. No. 320,600, Jan. 2, 1973, Pat. No. 3,899,513. This application Dec. 3, 1973, Ser. No. 421,497

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **2 Claims**

1. In a method of prophylactically treating allergic asthma in a mammal in need thereof by inhalational administration of a compound effective in said treatment, the improvement comprising:

prophylactically administering a compound selected from the group consisting of 1-(2-carboxychromon-5-yloxy)-2-(hydroxy)-3-(p-cyanophenoxy)-propane or a nontoxic, pharmacologically acceptable salt thereof to the mammal in an amount effective to treat said asthma.

3,953,605

ANTIMICROBIAL QUATERNARY AMMONIUM COMPOUNDS COMPOSITIONS

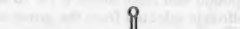
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 242,750, April 10, 1972, Pat. No. 3,882,166. This application Feb. 20, 1975, Ser. No. 551,372

Int. Cl.² A01N *9/24*

U.S. Cl. 424—311 **5 Claims**

1. An antimicrobial composition comprising about 0.1–10% by weight of an antimicrobial agent having the structural formula:



wherein R is a long chain alkyl group of 12–18 carbon atoms; R^1 and R^2 are methyl or ethyl groups; *n* is an integer from 1 to 6; Ar is a substituted aryl radical selected from the group consisting of phenyl and naphthyl, said substituted moiety being selected from the group consisting of tri-halo-and mono-nitro-radicals; and X is an anion selected from the class consisting of halides, sulfates and methosulfates, and a pharmaceutical carrier therefor.

3,953,606

COMPOSITIONS AND METHOD OF USING UREIDOTETRALIN COMPOUNDS OR DERIVATIVES THEREOF

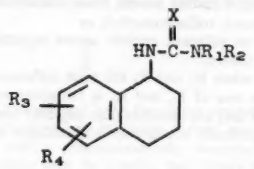
Larry Dean Spicer, Princeton; Joseph Michael Pensack, Trenton; Robert Daniel Wilbur, Titusville, all of N.J., and Gary Michael Demkovich, deceased, late of Cranbury, N.J. (by Ruth Ellen Demkovich, administratrix), assignors to American Cyanamid Company, Stamford, Conn.

Filed Feb. 7, 1974, Ser. No. 440,626

Int. Cl.² A61K *31/17*

U.S. Cl. 424—322 **14 Claims**

1. A method for enhancing the growth rate of ruminant livestock, poultry or fur bearing animals comprising, administering orally or parenterally to said animals a growth-enhancing amount of a racemic mixture or an optically active isomer of a compound of the formula:



wherein X is a member selected from the group consisting of sulfur and oxygen; R_1 is a member selected from the group consisting of hydrogen and alkyl C_1–C_4; R_2 is a member selected from the group consisting of hydrogen, alkyl C_1–C_4, alkoxy C_1–C_4, benzyl and benzyloxy; R_3 is a member selected from the group consisting of hydrogen, alkyl C_1–C_4 and alkoxy C_1–C_4; and R_4 is a member selected from the group consisting of hydrogen and alkyl C_1–C_4.

3,953,607

METHOD OF CONTROLLING INSECTS USING 7-ETHYXO-1-(p-ETHYLPHENOXY)-3,7-DIMETHYL-2-OCTENE

Morton Beroza, Silver Spring; Rafael Sarmiento, Laurel, and Terrence P. McGovern, Bowie, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 343,328, March 21, 1973, Pat. No. 3,873,724. This application Nov. 26, 1974, Ser. No. 527,319

Int. Cl.² A01N *9/24*

U.S. Cl. 424—341 **4 Claims**

1. A method of preventing the normal maturation of insects selected from the group consisting of the yellow mealworm, *Tenebrio molitor* (L.) and the confused flour beetle, *Tribolium confusum* Jacquelin duVal comprising contacting said insects at an early pupal stage with an effective maturation inhibiting amount of 7-ethoxy-1-(p-ethylphenoxy)-3,7-dimethyl-2-octene.

3,953,608

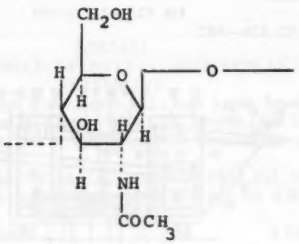
COSMETIC COMPOSITIONS FOR THE SKIN CONTAINING A CHITOSAN DERIVATIVE

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

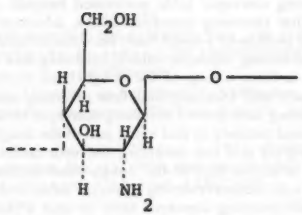
Division of Ser. No. 251,263, May 8, 1972, Pat. No. 3,879,376.
This application Sept. 11, 1974, Ser. No. 504,953
Claims priority, application Luxemburg, May 10, 1971, 63142
Int. Cl.² A61K 7/48
U.S. Cl. 424—361 8 Claims

1. A cosmetic composition for the skin comprising in an aqueous carrier a chitosan derivative consisting of randomly distributed patterns of the formulae:

(A)

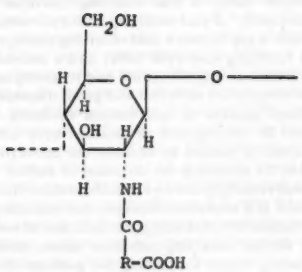


(B)

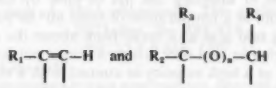


and

(C)



the proportions of these three patterns being, respectively, 5 to 30% for A, 5 to 40% for B and 30 to 90% for C, R representing a member selected from the group consisting of



wherein R_1 represents a member selected from the group consisting of hydrogen and methyl, n is equal to (a) O, in which case R_2, R_3 and R_4, each independently, represent a member selected from the group consisting of hydrogen; methyl; hydroxy; acetoxy; amino; monoalkylamino or dialkylamino, wherein the alkyl moiety of each has 1 to 12 carbon atoms and wherein each is optionally interrupted by one or more nitrogen atoms or substituted by one or more amino, hydroxyl, mercapto, carboxyl, alkylthio wherein the alkyl moiety has 1 to 8 carbon atoms and sulfonic groups; alkylthio wherein the alkyl moiety has 1 to 4 carbon atoms and carries an amino residue; and a residue of glutathion, at least one of R_2, R_3 and R_4 being hydrogen and radicals R_2 and R_3 being able to form together a methylene radical, and (b) 1, in which case R_2, R_3 and R_4 each represent hydrogen; and the salts formed by this derivative with a base selected from the group consisting of sodium hydroxide, potassium hydroxide, ammonia, lime, magnesia and alkanolamine and an acid selected from the group consisting of hydrochloric, phosphoric, acetic, lactic, tartaric and citric, said chitosan derivative being present in amounts of 0.1 – 20 percent by weight of said composition.

3,953,609

METHOD FOR THE GROWTH RESTRICTION OF UNDESIRABLE DIGESTIVE SYSTEM BACTERIA IN ANIMALS AND THE ESTABLISHMENT OF LACTOBACILLUS LACTIS NRRL B-5628

Stewart M. Farr, Sarasota, Fla., assignor to Microlife Technics, Inc., Sarasota, Fla.

Filed Feb. 6, 1974, Ser. No. 440,250
Int. Cl.² A23K 1/00
U.S. Cl. 426—2 8 Claims

1. The method for changing the digestive system bacteria in animals which comprises:

orally feeding a live bacterial composition of *Lactobacillus lactis* NRRL B-5628 mixed with a growth medium to said animals in an amount of at least 1×10^{10} cells per day per kg body weight of the animal and for a length of time sufficient to substantially reduce the number of such other digestive system bacteria and to achieve population dominance of NRRL B-5628 in the digestive system.

3,953,610

HIGH TEMPERATURE DIRECT ACIDIFICATION OF MILK

Lawrence L. Little, Creve Coeur, Mo., assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 31, 1975, Ser. No. 546,028

Int. Cl.² A23C *19/02*

U.S. Cl. 426—39 **6 Claims**

1. A process of lowering the pH of milk by direct acid additions to milk at a temperature of from 60° to 90°F, comprising: adding said acid as a spray from above the milk surface at a location in said milk where a minor portion of said milk is mixing at a high velocity in contact with a major portion of said milk, wherein the velocity of the milk at said location is in excess of about 4 feet per second, and wherein said acid is added at a rate of from about 0.4 to 4.69 H^+ equivalents per minute to yield a final pH in the range of from about 4.5 to 5.5.

3,953,611

SHAPED TEXTURED PROTEIN FOOD PRODUCT

Rudolph William Youngquist, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 16, 1974, Ser. No. 506,078

Int. Cl.² A23G *3/00*; **A23L** *1/36*

U.S. Cl. 426—93 **12 Claims**

1. A process for forming textured shaped protein food products comprising

a. coating particulate textured protein material with a binder consisting of from about 10 to 70%, by weight, of 7S soybean protein isolate, and from about 30 to 90%, by weight, water;

b. shaping the coated particulate material into a unitary shaped product; and

c. heating the shaped product to heat-set the binder.

3,953,612

PROCESS FOR PREPARING A FIBROUS PROTEIN PRODUCT AND THE PRODUCT THEREOF

Myron Julius Coplan, Natick; Robert Bernard Davis, and Daniel Kenneth Schiffer, both of Framingham, all of Mass., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Jan. 6, 1975, Ser. No. 538,820

Int. Cl.² A23J *3/00*

U.S. Cl. 426—104 **14 Claims**

1. A process for the production of a semi-unitary protein product consisting essentially of a bundle of intermittently fused protein fibers which comprises mixing a finely-divided oilseed protein material with water to form a mixture containing from about 25 to about 60 percent by weight of the protein material, heating the mixture to a temperature from about 100° C. to about 180° C. to form an essentially homogeneous, extrudable plastic mass and then extruding this mass under suitable pressure conditions through a spinneret directly into an essentially inert gaseous medium whereby there is intermittent fusing of the extruded protein fibers to yield the desired semi-unitary protein product, wherein such spinneret has a plurality of orifices each having a cross-sectional dimension from about 0.001 to about 0.01 in., said orifices being spaced apart from each other a distance not greater than one orifice cross-sectional dimension.

3,953,613

METHOD OF AND APPARATUS FOR THE TRANSVERSE FOLDING OF DOUGH BAND SECTIONS

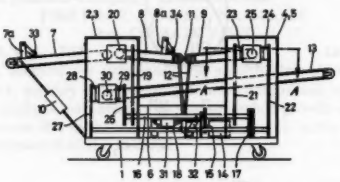
Eugen Morgenthaler, Kirchberg, and Ruedi Seewer, Burgdorf, both of Switzerland, assignors to Seewer AG, Burgdorf, Switzerland

Filed Oct. 24, 1974, Ser. No. 517,595

Claims priority, application Germany, Aug. 17, 1974, 2439496

Int. Cl.² A21C *11/00*

U.S. Cl. 426—502 **9 Claims**



1. A method of operating conveyor tables to transversely fold a dough band section comprising the steps of providing a receiving conveyor table, a first reversing conveyor table and a second reversing conveyor table, said first reversing conveyor table being positioned subsequently of said receiving conveyor table and forming a gap therebetween, said second reversing conveyor table positioned beneath said receiving and first reversing conveyor tables, advancing a predetermined portion of a dough band section over said receiving and first reversing conveyor tables, reversing said first conveyor table to form a loop of the dough band section in the gap between said receiving and first reversing conveyor tables, advancing said second reversing conveyor table for a predetermined distance so that a first part of the dough band section running off said first reversing conveyor table comes to bear upon a second part of the dough band section which bears upon said second reversing conveyor table, and reversing said second reversing conveyor table so that a third part of the dough band section running off the receiving conveyor table comes to bear upon the first and second parts of the dough band section.

3. A machine for the transverse folding of a dough band section, comprising a plurality of conveyor tables each having a conveyor band, said conveyor tables comprising a receiving conveyor table, a first reversing conveyor table arranged subsequently of said receiving conveyor table and positioned to form a gap between said receiving conveyor table and said first reversing conveyor table, and a second reversing conveyor table arranged beneath said receiving and first reversing conveying tables such that said gap is disposed above an intermediate portion of said second reversing conveyor table, means for driving each of said conveyor tables in a forward direction of motion to advance the conveyor bands thereof, means for reversing the direction of motion of said first and second reversing conveyor tables to drive the conveyor bands thereof in a rearward direction, automatically operating control means for controlling the direction of motion of said first and second reversing conveyor tables, said control means including means for sensing the position of the dough band

section as it is advanced over said receiving conveyor table and said first reversing conveyor table, means operatively coupled between said sensing means and the reversing means of said first reversing conveyor table for actuating reversal thereof after a first predetermined portion of the dough band section has advanced over said first reversing conveyor table, the reversal of the direction of motion of said first reversing conveyor table causing the dough band section to be formed into a loop in said gap and bear against the conveyor band of said second reversing conveyor table, and means operatively coupled between said sensing means and the reversing means of said second reversing conveyor table for actuating reversal thereof after a second predetermined portion of the dough band section has advanced over said second reversing conveyor table.

3,953,614

4,7-DIHYDRO-2-(3-PENTYL)-1,3-DIOXEPIN AS A FLAVORANT

Robert F. Tavares, Cedar Grove, N.J.; Jack Agran, Brooklyn, N.Y.; William M. Easter, Hasbrouck Heights, and Leslie Blau, Dumont, both of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Division of Ser. No. 342,122, March 16, 1973, Pat. No. 3,822,291. This application May 15, 1974, Ser. No. 470,245

Int. Cl.² A23L *1/226*

U.S. Cl. 426—536 **2 Claims**

1. A method for flavoring a food which comprises adding thereto an amount of 4,7-dihydro-2-(3-pentyl)-1,3-dioxepin sufficient to impart to the food a vegetative, earthy flavor.

3,953,615

HYDRATION DRYING OF COFFEE, TEA, OR JUICE CONCENTRATE BY MEANS OF ANHYDROUS DEXTROSE

Ashis S. Gupta, Marietta, and Clifford A. Shillinglaw, Dunwoody, both of Ga., assignors to The Coca-Cola Co., Atlanta, Ga.

Continuation of Ser. No. 168,727, Aug. 3, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,468

Int. Cl.² A23F *1/12, 3/00;* **A23L** *2/08*

U.S. Cl. 426—594 **3 Claims**

1. A hydration drying process for preparing a dried, free-flowing juice powder without the necessity of a high temperature heating operation from a juice concentrate selected from the group consisting of orange juice, grape juice and tea, which comprises admixing a juice concentrate with at least 11 grams of ahydrous dextrose for each gram of moisture present in said juice concentrate in an agitating device until the anhydrous dextrose is substantially hydrated and a free-flowing non-hygroscopic juice powder having a rapid rate of dispersibility and dissolution upon reconstitution in water is produced, said anhydrous dextrose being admixed in a powdered or pulverized state to reduce the drying time required to produce a dried, free-flowing product, and wherein the rate of hydration of the dextrose molecules is expedited by heating the mixture at low temperatures of about 35° centigrade to 85° centigrade, and further wherein said juice powder has a total moisture content of about 5%, most of which is bound moisture in the hydrated dextrose molecules, and further wherein only a negligible amount of free moisture is available in the powder for wetting or subsequent chemical reaction with other particles during the drying process.

3,953,616

ORGANIC ACID DERIVATIVES

Paul D. Thomas, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 805,020, March 6, 1969, which is a continuation of Ser. No. 446,429, April 7, 1965, abandoned, and Ser. No. 661,221, Aug. 17, 1967, abandoned, which is a continuation-in-part of Ser. No. 391,080, Aug. 21, 1964, Pat. No. 3,343,964, which is a continuation-in-part of Ser. No. 306,277, Sept. 3, 1963, abandoned. This application July 25, 1973, Ser. No. 382,394

Int. Cl.² A23K *1/00*

U.S. Cl. 426—637 **5 Claims**

1. An improved potato composition adapted for reconstitution with water comprising dehyrated potato in comminuted form together with from about 0.1% to about 2% by weight, based on dried potato weight, of a substance selected from the group consisting of the sodium, potassium, calcium and magnesium salts of monoalkyl acid fumarates and maleates containing from 14 to 18 carbon atoms in the alkyl group.

3,953,617

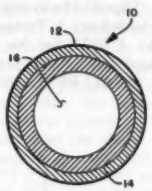
METHOD OF PRODUCING ENCAPSULATED THERMONUCLEAR FUEL PARTICLES

Warren H. Smith, Dayton; William L. Taylor, Cincinnati, and Harold L. Turner, Dayton, all of Ohio, assignors to The United States of America as represented by the United States Energy Research & Development Administration, Washington, D.C.

Filed Jan. 28, 1974, Ser. No. 438,499

Int. Cl.² G21C *3/06*

U.S. Cl. 427—6 **4 Claims**



1. A method of producing a fuel particle comprising forming hollow spheroids of a material with mass number above 50, thereafter immersing said hollow spheroids in a gaseous atmosphere selected from the group consisting of deuterium, tritium, and mixtures thereof, subsequently heating said spheroids to from about 370° Kelvin to about 770° Kelvin for a period of time of about 1 to 48 hours and at pressures of from about 2 pounds per square inch to about the ultimate tensile strength of said material spheroids, said heating and said pressure effecting diffusion of said gas into said spheroids, and thereafter cooling said hollow spheroids having said gas diffused therein to from about 77° Kelvin to about 4° Kelvin.

3,953,618

ELECTROSTATIC IMAGE DEVELOPING PROCESS

Eric P. Muntz, Pasadena, and Murray S. Welkowsky, Los Angeles, both of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Division of Ser. No. 356,502, May 2, 1973, Pat. No. 3,861,354. This application Sept. 20, 1974, Ser. No. 507,677

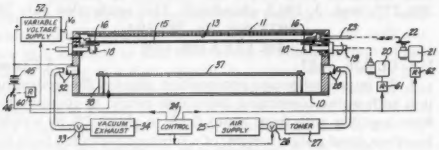
Int. Cl.² G03G *13/00*

U.S. Cl. 427—21 **3 Claims**

1. A process for developing an electrostatic image on a receptor sheet, including the steps of:

producing a cloud of positive and negative charged toner powder particles;

attracting said toner particles of one polarity to a first electrode remote from the receptor sheet and said toner particles of the opposite polarity to a second apertured electrode positioned adjacent the side of the receptor sheet bearing the electrostatic image and between the receptor sheet and the first electrode by applying an electric potential across the first and second electrodes;



attracting the toner particles of said opposite polarity through the second apertured electrode to deposit the toner particles onto the electrostatic image on the receptor sheet at localities having a charge potential with respect to the potential of the second electrode;

varying the potential of the second electrode as a function of time during the deposition of the toner particles; and

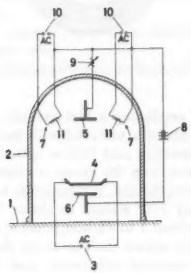
varying the distance between the second electrode and the receptor sheet as a function of time during the deposition of the toner particles.

3,953,619

METHOD FOR IONIZATION ELECTROSTATIC PLATING

Kiyoshi Matsubara, Higashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 3, 1973, Ser. No. 403,060
Claims priority, application Japan, Oct. 3, 1972, 47-99291
Int. Cl.² B05D *3/06*
U.S. Cl. 427—39 **5 Claims**



1. In an ionization electrostatic plating method wherein glow discharge is generated in a closed atmosphere of a rare gas containing therein a coating material and an article subjected to plating and said coating material is vaporized so that the vaporized coating material is ionized and accelerated to be deposited on the article subjected to plating, the improvement therein comprising having a cathode disposed adjacent but separate from said article subjected to plating, effecting the acceleration of the ionized vapor of coating material by means of said cathode and controlling the ionization current flowing to said article subjected to plating to a level such that it will heat the article to a temperature necessary for plating and will not cause the article to function as a principal cathode.

3,953,620

PRODUCING INTEGRATED OPTICAL CIRCUITS

Edwin Arthur Chandross, Berkeley Heights; Coralie Anne Pryde, Morristown; Walter John Tomlinson, III, Holmdel, and Heinz Paul Weber, Middletown, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 6, 1974, Ser. No. 530,506
Int. Cl.² B05D *3/06*
U.S. Cl. 427—53 **3 Claims**

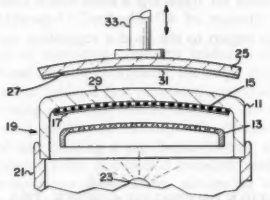
1. In the method for the fabrication of an optical waveguide device comprising the steps of doping a liquid solution of transparent polymer in a solvent with a photosensitive monomer of higher index of refraction than that of said polymer, said monomer being capable of subsequent molecular structural changes which tend to lock said monomer in said polymer upon exposure to electromagnetic radiation of a selected wavelength, depositing a film of the doped liquid solution on a substrate support, evaporating the solvent from the solution, selectively exposing the film to said beam of radiation to lock said monomer in selected portions of said film and heating said film to reduce the unexposed monomer, the improvement which comprises utilizing a polynuclear aromatic thiol dopant.

3,953,621

PROCESS OF FORMING CATHODE RAY TUBE SCREENS

Robert L. Donofrio, Elbridge, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 21, 1974, Ser. No. 453,437
Int. Cl.² B05D *3/06;* **H01J** *31/20*
U.S. Cl. 427—54 **8 Claims**



1. An improvement in the exposure process of forming a patterned cathodoluminescent screen of discrete phosphor elements on the viewing area of the face panel of a cathode ray tube in overlay relationship to an opaquely defined windowed webbing priorly disposed thereon, in accordance with an apertured mask spatially positioned within the panel, whereof exposure energy beamed through the mask impinges and polymerizes selected areas of a phosphor related energy-sensitive coating applied over the webbing, said improvement being in the screen exposure process for disposing said phosphor elements comprising:

positioning said coated panel, with said mask oriented therein, on a screen exposure apparatus accommodating a source of exposure radiant energy;

placing a reflective medium relative to the exterior surface of said panel, said medium being of a shaping compatible with the exterior contour of said panel; and

beaming said exposure energy through said aperture mask to initiate primary ray polymerization of discrete coating areas superimposed on defined window-areas of said webbing, a portion of said primary radiation upon traversing said coating and said panel therebeneath impinges said reflective medium to produce reflected secondary radiation which retraverses the panel effecting augmented secondary ray polymerization of substantially the obverse region of the interfacially related coating in the window areas.

3,953,622

METHOD OF FORMING A NON-GLOSSY FILM

Marco Wismer, Gibsonia, and Earl E. Parker, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 135,815, April 20, 1971, abandoned. This application Apr. 3, 1974, Ser. No. 457,336

Int. Cl.² B44D 1/44; C03H 19/00; C08K 1/82

U.S. Cl. 427—54 8 Claims

1. A method comprising:

a. applying to a substrate a first coating composition comprising an ethylenically unsaturated polyester, an ethylenically unsaturated monomer and from about 0.1 to about 10 percent by weight based upon the interpolymerizable materials present, of a peroxide catalyst to form a coating thereon having an outer surface;

b. treating said coating with enough ultraviolet light to gel said coating to a state wherein said outer surface is at least hard enough so that it does not intermix with a wet second coating composition applied thereto;

c. applying as a coating to said outer surface of said gelled coating a catalyst-free second coating composition comprising an ethylenically unsaturated polyester and an ethylenically unsaturated monomer and at least about 5 percent by weight ultraviolet light absorbing pigment to form a composite coating; and

d. treating said composite coating with ultraviolet light to obtain a durable cured composite coating having resistance to solvent attack and a lower gloss than a coating of said catalyst-free second coating composition when cured in like manner but in the absence of said gelled first composition.

3,953,623

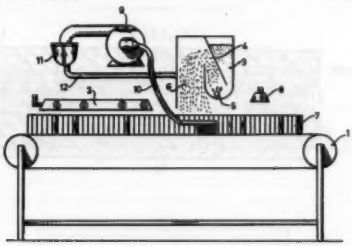
PROCESS OF SELECTIVELY COATING EARTHENWARE ARTICLES

Johannes Cornelis Das, 5, Geerstraat, Bergeyk, Netherlands

Continuation-in-part of Ser. No. 206,704, Dec. 10, 1971, abandoned. This application May 28, 1974, Ser. No. 473,692

Int. Cl.² B05D 3/02, 1/40, 3/12

U.S. Cl. 427—189 5 Claims



1. A process for coating a desired portion of the surface of earthenware articles having a porous surface comprising the steps of:

a. Positioning earthenware articles to be coated with a particulate coating material with the surface to be coated facing upwardly;

b. Heating only the portion of the upwardly facing surface which is to be coated to a temperature above the melting temperature of the coating material without substantial heating of the earthenware articles below the surface layer;

c. Applying particles of the coating material to said heated surface layer thereby forming a continous layer of coating thereon;

d. Heating the surface layer of the coating to a temperature between the melting point of the coating material and a temperature equal to or below the temperature to which the surface of the article has been heated in step (B) in order to produce a smooth layer of coating material;

e. Cooling the article after the particulate coating material has at least partially adhered to the surface layer of the article to form the desired coating thereon, the unheated portion of the surface of the article remaining substantially free of said coating material.

3,953,624

METHOD OF ELECTROLESSLY DEPOSITING NICKEL-PHOSPHORUS ALLOYS

Anthony Francis Arnold, Ringoes, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,136

Int. Cl.² C23C 3/02

U.S. Cl. 427—256 4 Claims

4. A method of electrolessly depositing a non-homogeneous layer of nickel-phosphorus alloys on a catalytic surface, comprising:

treating said surface with an aqueous bath comprising a nickel salt of a non-oxidizing, non-chelating acid, hypophosphite ion in an amount of 2 to 3.2 moles per mole of nickel salt, lactic acid or an alkali metal lactate in an amount of 0.1 to 1.0 mole per mole of nickel salt not exceeding a total concentration of 0.055 moles/liter, an aliphatic carboxylic acid, an alkali metal hydroxide or ammonium hydroxide and a hydroxyacetic acid or an alkali metal salt thereof, wherein the initial nickel content of the bath is about 0.02 to 0.04 moles per liter, the remaining ingredients, other than nickel, are present in such proportions as to provide an initially high plating rate at a relatively high initial acid pH of about 4.5 to 7, the carboxylic acid is present in an amount to maintain the initially high pH until most of the nickel is depleted at which time the pH abruptly drops to a lower value which is determined by the ratio of hypophosphite to lactate and hydroxyacetate ions, and the nickel salt is sufficient to maintain a phosphorus deposition rate that drops more slowly than the nickel deposition rate, whereby the phosphorus content of the deposit rises as deposition proceeds after the abrupt drop in pH,

continuing the deposition process until the pH drops to a level of about 3.75 ± 0.10 and the nickel content of the bath is about 10% of the initial concentration, and

terminating the treatment without replenishing any of the bath ingredients.

3,953,625

PROCESS FOR MAKING INDICIA BEARING ANODIZED ARTICLE

Harold J. Quaintance, Fairview Park, and Eugene Wainer, Shaker Hts., both of Ohio, assignors to Horizons Incorporated, Cleveland, Ohio

Division of Ser. No. 205,493, Dec. 7, 1971, Pat. No. 3,765,994. This application July 13, 1973, Ser. No. 378,849

Int. Cl.² B05D 1/00

U.S. Cl. 427—258 13 Claims

1. In a process for producing an indicia bearing laminated article which comprises:

providing an anodized member consisting of an aluminum metal base composed of anodizable metal selected from the group consisting of aluminum and aluminum base

alloys and an anodized oxide layer on said metal base, said oxide layer consisting of a non-porous thin oxide band adjacent to the metal base and a porous layer of oxide integral with said non-porous layer and producing an image in said porous layer, which image can only be viewed by reflected light; the improvements which comprise:

applying a clear protective organic material to the surface of said porous layer to bury the image in said pores and to protect the image in said pores and to render said layer self-supporting and chemically removing the metal base from said article whereby the image in said layer can be viewed by diffused light and can be projected by direct illumination.

3,953,626

COATING METHOD

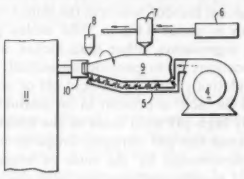
Motoaki Suzuki, and Hitoshi Muroi, both of Tokyo, Japan, assignors to Toyo Ink Manufacturing Company, Ltd., Tokyo, Japan

Filed Dec. 26, 1973, Ser. No. 428,572

Claims priority, application Japan, Dec. 23, 1972, 47-128841; Oct. 19, 1973, 48-116865

Int. Cl.² B05D *3/04*

U.S. Cl. 427—346 **1 Claim**



1. A method for coating bottles, which comprises rotating a bottle about its longitudinal axis while maintaining said axis horizontal, extruding a high viscosity paint in filament-like form from a nozzle positioned about said bottle and at the same time moving said nozzle along the length of said bottle from a position above the neck of said bottle to a position above said bottle but beyond the bottle bottom thereby to form a coating on the surface of the body surface of said bottle, blowing a gas against the filament of paint when said nozzle has moved to said position beyond the bottle bottom to cause the filament to flow towards said bottle bottom and adhere to the bottom surface of said bottle to form a coated surface on said bottom surface, and then smoothening the coated surfaces of the body and bottom surfaces of the bottle by blowing a gas against the surface of said paint coating.

3,953,627

FLAME-RETARDANT WOOD CONTAINING 1,1,2,4-TETRABROMOBUTENE-2 AND PROCESS FOR ITS PRODUCTION

Roy G. Turnbo, Deer Park; David G. Walker, Baytown, both of Tex., and Marvin Rosen, Warren, N.J., assignors to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 15, 1974, Ser. No. 461,264

Int. Cl.² C09K *3/28*

U.S. Cl. 427—427 **20 Claims**

1. A flame-retardant composition that comprises wood and a flame-retarding amount of 1,1,2,4-tetrabromobutene-2.

14. The process of claim 11 wherein a solution of 1,1,2,4-tetrabromobutene-2 in an inert organic solvent is applied to the wood.

3,953,628

PROCESS FOR MAKING PITCH IMPREGNATED ARTICLES

Charles R. Gannon, Ashland, Ky., assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Aug. 22, 1973, Ser. No. 390,670

Int. Cl.² B05D *1/18*

U.S. Cl. 427—442 **5 Claims**

1. In a process for manufacturing an impregnated fiber pipe wherein;

a. a porous tubular body is formed;

b. the tubular body is immersed in a liquid mixture of (1) a particulated metallic pigment previously milled in the presence of stearic acid, and (2) molten pitch selected from the group consiting of coal tar pitch, oxidized petroleum pitch, unoxidized petroleum pitch and mixtures thereof at a temperature of about 270°F to about 375°F., and

c. said liquid mixture is forced into interstices in said tubular form; the improvement comprising:

d. prior to immersing said tubular body in said mixture dispersing between about 4 and about 30 parts by weight of additional stearic acid per 100 parts of metallic pigment in said mixture.

3,953,629

SYNTHETIC CONCRETE LAMINATE

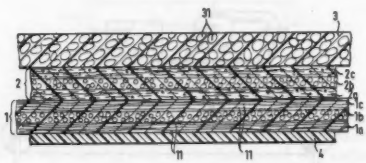
Ludwig Wesch, Heidelberg, Germany, assignor to Manufacture de Machines du Haut-Rhin-Manurhin S.A., Mulhouse, France

Filed June 5, 1972, Ser. No. 259,686

Claims priority, application Germany, June 11, 1971, 2129143

Int. Cl.² F16L *9/10*

U.S. Cl. 428—36 **14 Claims**



1. A synthetic concrete laminate comprising essentially an outer synthetic concrete layer bonded to an intermediate barrier layer comprised of a synthetic resin, said barrier layer being in turn bonded to a carrier layer comprised of a synthetic resin with reinforcing fibers embedded therein,

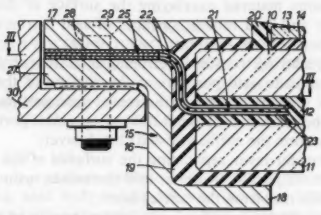
said barrier layer being formed of a laminate of plural layer portions comprising a first outer barrier layer portion which is bonded to said concrete layer, an intermediate barrier layer portion and a second outer barrier layer portion which is bonded to said carrier layer, said intermediate layer portion being comprised of filler material and a synthetic resin, said first and second outer barrier layer portions bonded respectively to said concrete layer and to said carrier layer being characterized by the property of having a greater percent of elongation in tension and lower modulus of elasticity than either of said concrete and said carrier layers.

3,953,630

LAMINATED TRANSPARENT ASSEMBLIES

William Gary Roberts, West Hagley, and Robert Burns, Leigh, both of England, assignors to Triplex Safety Glass Company Limited, London, England

Filed Mar. 8, 1973, Ser. No. 339,036
Claims priority, application United Kingdom, Mar. 13, 1972, 11621/72
Int. Cl.² B60J 1/00
U.S. Cl. 428—38 18 Claims



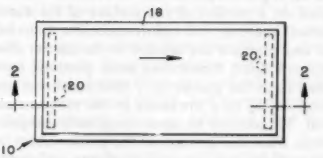
1. In a laminated transparent assembly suitable for use as a windscreen in a high speed vehicle such as an aircraft, the assembly comprising a load bearing sheet of toughened glass having a second sheet of glass laminated thereto by means of an impact resistant interlayer of plastics material and an insert which is partially embedded in and extends around the periphery of the interlayer, the improvement comprising utilizing an insert of high tensile strength fibrous material having an inner flexible portion of the insert embedded in the outer marginal portion of the interlayer, an intermediate flexible portion of the insert adjacent to and extending outwardly from the edges of the interlayer to ensure flexibility in the attachment of the assembly to the structure of the vehicle and outer marginal portion of the insert which is reinforced to provide for said attachment of the assembly to the structure of the vehicle.

3,953,631

DUST COLLECTION MATS

David Edward Gordon, LaGrange, Ga., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Sept. 4, 1974, Ser. No. 503,069
Int. Cl.² D03D 27/00
U.S. Cl. 428—95 1 Claim



1. A dust control mat comprising: a sheet of textile material, a plurality of tufts of yarn connected thereto, a latex material coated to said sheet material holding said yarn tufts in said sheet material, a calendered rubber sheet laminated to said latex material and a woven reinforcing strip located between said latex material and said calendered rubber sheet with the elongated dimension being substantially perpendicular to the grain direction of said calendered rubber material, said reinforcing strip being shorter than the calendered rubber sheet and said sheet material in the length of the mat perpendicular to the grain direction of the calendered rubber sheet and being located adjacent one edge of said calendered rubber sheet.

3,953,632

RESIN IMPREGNATED MATS AND METHOD OF MAKING THE SAME

Leonard W. Robinson, Trenton, Mich., assignor to Woodall Industries Inc., Detroit, Mich.

Filed Apr. 29, 1974, Ser. No. 465,419
Int. Cl.² D03D 27/00; D04H 11/00; D05C 17/00
U.S. Cl. 428—95 16 Claims

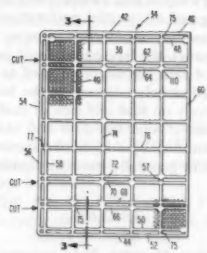
1. As a new article of manufacture, a compressed mat of randomly oriented plastic fibers, impregnated with a heat cured resin system including a thermosetting resin selected from the group consisting of melamine-formaldehyde, hexamethoxymethylmelamine and urea-formaldehyde resins, and a thermoplastic copolymer that is the product of the polymerization of a plurality of monomers at least one of which is a vinyl compound with an acid generating catalyst; pressure shaped to conform to a desired contour.

3,953,633

PLASTIC ELECTROPLATING BARREL WITH RIBBED PERFORATE MODULAR PANELS

Walter F. Noonan, Wallingford, Pa., assignor to Westlake Plastics Company, Lenni, Pa.

Filed June 20, 1974, Ser. No. 481,220
Int. Cl.² C25D 17/20; B32B 27/32, 17/04, 3/10
U.S. Cl. 428—131 7 Claims

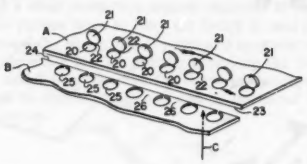


1. For use in forming the perforate panels of a plastic polyhedral electroplating barrel, a substantially rectangular plastic module having a relatively substantially flat thin perforate plate and a gridwork of rectangularly intersecting ribs extending vertically therefrom, there being closely spaced double ribs along both longitudinal edges of the module and along at least one lateral edge thereof, the remaining intersecting ribs being single and relatively widely spaced apart, said modules being adapted to abut each other at corresponding lateral edges to form the complete perforate panel, said reinforced longitudinal edges of each module adapted to be received and retained in longitudinal rail grooves and said reinforced lateral edges of end modules adapted to be received and retained in end head grooves.

3,953,634
SEAM STRUCTURE

William A. Wootten, 425 Via Corta, Malaga Cove Plaza, Palos Verdes Estates, Calif. 90274

Filed Aug. 22, 1973, Ser. No. 390,680
Int. Cl.² B31F 5/02; B32B 3/10
U.S. Cl. 428—133 6 Claims



1. A seam structure comprising a first panel having a plurality of spaced, rounded partial perforations therein bounded by the material of said first panel and defining a plurality of flat first tabs each of which is displaced away from one side of said first panel about a hinge line comprising the uncut portion of its associated partial perforation, a second panel positioned on the other side of said first panel and having a row of round perforations along a boundary edge thereof and opening into said boundary edge respectively and defining a plurality of spaced flat second tabs between said round perforations respectively, each of said second tabs having a comparatively narrow neck with arcuate sides flaring outwardly into a wider tip portion having an outer free end, the minimum width of each of said arcuatesided necks being substantially equal in dimension to the diameter of each of the partial perforations in said first panel, the necks of said second tabs extending from said second panel from a position on the other side of said first panel through said rounded partial perforations respectively to a position adjacent said one side of said first panel, the outwardly flaring neck and tip portions of each of said flat second tabs being disposed in closely adjacent surface facing relationship to one of said flat first tabs in a plane generally parallel to the plane defined by the edge of the associated partial perforation and at a position adjacent said one side of said first panel, the wider tip portion of each of said second tabs being shaped and dimensioned to extend beyond the boundary edge of the partial perforation through which the neck of said second tab extends so as to overlie said one side of said first panel, the free ends of said second tabs comprising portions of said boundary edge of said second panel and being disposed closely adjacent to the hinge lines of said first tabs respectively on said one side of said first panel, and the facing surfaces of said flat first and second tabs being attached to one another by a layer of adhesive therebetween to hold said tabs in generally parallel planar relationship to one another.

3,953,635
HOT STAMP TAPE

Richard E. Dunning, Munster, Ind., assignor to Avery Products Corporation, San Marino, Calif.

Continuation of Ser. No. 338,238, March 5, 1973, abandoned, which is a continuation of Ser. No. 233,463, March 10, 1972, abandoned, which is a division of Ser. No. 188,423, Oct. 12, 1971, Pat. No. 3,666,516. This application July 12, 1974, Ser. No. 487,925
The portion of the term of this patent subsequent to May 30, 1989, has been disclaimed.
Int. Cl.² B44C 1/16, 1/20; D41M 3/12
U.S. Cl. 428—151 33 Claims

1. A hot transfer sheet comprising a carrier layer, and a transfer layer which is stably associated with the carrier layer at ambient temperatures, but which is dissociable therefrom under heat transfer conditions;

said carrier layer being formed from a flexible, foldable material;

said carrier layer having a plurality of discrete spaced apart portions of thermoset resin coated on the surface thereof, attached thereto, and non-transferable therefrom under normal heat transfer conditions;

said surface of said carrier layer having portions which are not coated with said thermoset resin;

said spaced apart thermoset resin portions having surfaces remote from the surface of said carrier layer which have a specular reflectance which is different from the specular reflectance of the portions of the surface of the carrier which are not coated with said thermoset resin;

said transfer layer comprising a thermoplastic synthetic resinous material overlaying the surface of the carrier layer and said remote surfaces of said thermoset resin portions coated thereon;

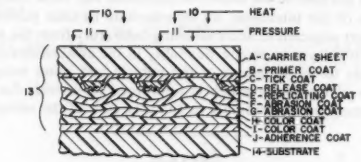
said overlaying transfer layer being of sufficient thickness to replicate said portions of the surface of the carrier layer uncoated with said thermoset resin portions as well as the surfaces of said thermoset resin portions remote from the surface of said carrier layer;

said transfer layer replicating the surfaces of the thermoset resin portions without said thermoset resin portions transferring from the carrier layer;

said overlaying transfer layer being capable of adhering to a substrate of choice under conditions of heat transfer.

14. A hot transfer sheet according to claim 1 in which the spaced apart portions of thermoset resin include an amino aldehyde resin, and a synthetic resinous material which includes a copolymer of vinyl chloride, vinyl acetate, and a monomer copolymerizable therewith.

15. A hot transfer sheet according to claim 14 in which the monomer is maleic acid.



33. A laminate for providing on a substrate a decorative finish having a surface characterized by discrete spaced apart portions which vary in specular reflectance from other portions of the surface comprising:

a heat-resistant, flexible, foldable carrier sheet having a surface having a predetermined specular reflectance;

a plurality of discrete spaced apart portions of thermoset resin having a fine particulate filler embedded therein and coated on a portion of the surface of the carrier sheet, attached thereto, and non-transferable therefrom when heat and pressure are applied to the carrier sheet;

said spaced apart thrermoset resin portions having been coated onto the carrier in a fluid condition and shrunk during drying to a thickness in the range of about 5 to about 20 microns to form irregularly shaped surfaces remote from the surface of the carrier sheet, which remote surfaces have a specular reflectance lower than that of the portions of the surface of the carrier which are not coated by the thermoset resin portions; and

a transferable replicating layer in overlaying contact with the carrier sheet and said spaced apart thermoset resin portions, the replicating layer comprising a coating of sufficient thickness of a synthetic resinous material to replicate the specular reflectance of the remote surfaces of the spaced apart thermoset resin portions and the specular reflectance of the portions of the carrier sheet not coated by said spaced apart portions;

the replicating layer replicating the reflectance of the remote surfaces of the thermoset resin portions without said thermoset resin portions transferring from the carrier sheet;

said replicating layer being releasable from contact with the carrier sheet and said spaced apart thermoset resin portions to provide a decorative replicating layer having a surface having a plurality of discrete spaced apart portions which vary in specular reflectance from the remaining portion of the surface;

whereby a laminate comprising the carrier sheet and the replicating layer can be applied to a substrate and heated to adhere the replicating layer to the substrate, with the carrier sheet being released from the replicating layer to provide said replicating layer as a surface finish attached to the substrate.

3,953,636

METHOD OF IMPROVING IMPACT RESISTANCE OF CERAMIC BODIES, AND IMPROVED BODIES

Henry P. Kirchner, Borough of State College, Pa., assignor to Ceramic Finishing Company, State College, Pa.

Filed Apr. 24, 1974, Ser. No. 463,837

Int. Cl.² B32B *17/00*

U.S. Cl. 428—155 **6 Claims**

1. A polycrystalline ceramic body having improved impact resistance, said body having adhered thereto a layer of low elastic modulus polycrystalline ceramic material having microcracks therein.

3,953,637

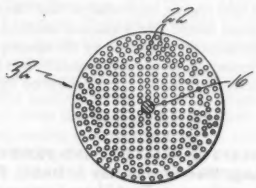
SLENDER ROD FOR FISHING RODS AND METHOD OF MAKING THE SAME

Donald F. Phillips, West Granby, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Oct. 31, 1974, Ser. No. 519,883

Int. Cl.² A01K *87/00*; **B32B** *15/02, 27/02, 15/14*

U.S. Cl. 428—156 **2 Claims**



1. A solid tapered rod of circular cross section for use as a fishing rod comprising:

a metal wire core extending the length of the rod;

a plurality of parallel, continuous boron filaments being uniformly disposed about said wire to define a tapered intermediate rod of circular cross section, said boron filaments being less in number at one end of the wire than at the other end to provide taper to said rod; and

a plurality of high modulus, high strength, low density continuous filaments having an elastic modulus appreciably lower than said boron filaments uniformly disposed as an outer layer about said plurality of boron filaments and in parallel relationship thereto, said wire, said boron filaments and said high modulus, high strength, low density filaments being embedded in and bonded to a cured resin matrix.

3,953,638

MULTI-PLY ABSORBENT WIPING PRODUCT HAVING RELATIVELY INEXTENSIBLE CENTER PLY BONDED TO HIGHLY EXTENSIBLE OUTER PLIES

Clifford B. Kemp, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 26, 1973, Ser. No. 419,022

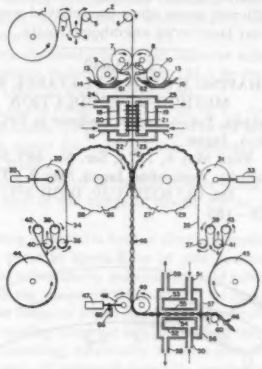
Int. Cl.² B31F *1/12*; **B32B** *5/00*

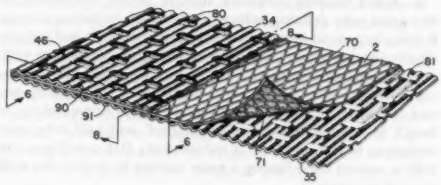
U.S. Cl. 428—154 **26 Claims**

1. A method for producing a multi-layered absorbent paper wiping product, comprising the steps of:

a. imprinting a continuous pattern of water-resistant, reinforcing resin on at least one side of a relatively inextensible central ply of tissue paper having less than about 10 percent total stretch, said pattern covering between about 15 and about 55 percent of the total surface area thereof;

b. reducing the total moisture content of said resin-reinforced central ply to not more than about 10 percent; and





c. intermittently bonding an outermost ply of highly extensible tissue paper having between about 15 percent and about 50 percent crepe to each side of said central ply at points of embossment formed in each of said outermost plies, said points of embossment constituting between about 7 percent and about 50 percent of the total surface area of each of said outermost plies.

3,953,639

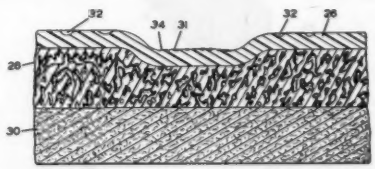
MECHANICALLY EMBOSSED RESILIENT LAMINAR FLOOR MATERIAL

Walter J. Lewicki, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Division of Ser. No. 442,770, Feb. 15, 1974, Pat. No. 3,887,678. This application Nov. 18, 1974, Ser. No. 524,523

Int. Cl.² B32B *3/26*

U.S. Cl. 428—160 **2 Claims**



1. A floor covering material which is composed of a three-layer structure, the lower layer being a backing material, the intermediate full foamed layer being a flexible foamed thermoplastic or thermoset material, and the upper layer being a wear layer; the wear layer having an embossed pattern placed

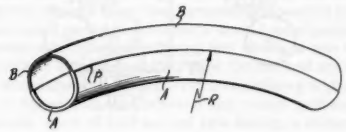
on the surface thereof, said embossed pattern being both surface texturing and deep embossing, said wear layer being greater than approximately 1/6 to 1/4 the thickness of the foam layer and being deeply embossed in depth approximately the thickness of the wear layer, the fully foamed intermediate layer in the region of the deep embossing having a substantially undamaged, but compressed, fully foamed, cell structure which is capable, upon reheating of the sheet material, of exerting sufficient stress upon the relieved wear layer to restore the wear layer to its unembossed state.

3,953,640

SELF-SHAPING WOVEN INFLATABLE BELT AND METHOD OF PRODUCTION

Juichiro Takada, Tokyo, Japan, assignor to Takata Kojyo Co., Ltd., Tokyo, Japan

Filed May 6, 1974, Ser. No. 467,346
Claims priority, application Japan, May 9, 1973, 48-53688
Int. Cl.² B32B *3/20*; D03D *3/02*
U.S. Cl. 428—188 **7 Claims**



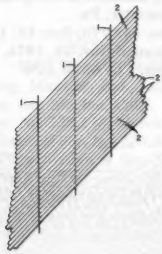
1. A self shaping inflatable tubular device comprising an elongated tube defining hollow woven band, including circumferentially spaced longitudinally extending warps and longitudinally spaced continuously circumferentially extending wefts interweaving said warps, first warps along a first side of said tube being shorter than second warps along an opposite second side of said tube, whereby said tube is curved along its length in the inflated condition thereof, and said tube upon deflation, is collapsible to a substantially flat condition, said hollow woven band having a resin coating to render the walls thereof impervious.

3,953,641

PLY OF PARALLEL FILAMENTS

Paul Marquis, Tassin-La-Demi-Lune, France, assignor to Societe Civile D'Etudes et de Recherches pour L'Obtention de Fibres Minerales (S.E.R.O.F.I.M.), Paris, France

Filed Apr. 19, 1973, Ser. No. 352,624
Claims priority, application France, Apr. 19, 1972, 72.14536
Int. Cl.² B32B *7/14*; D02G *3/00*
U.S. Cl. 428—195 **11 Claims**



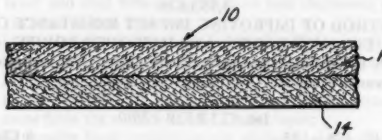
1. A ply of parallel continuous carbon filaments arranged one against the other substantially free from any space between them along their whole length, having a weight per unit of surface of not more than 450 grams per square meter and a thickness of not more than 1 millimeter, said filaments being bound together by fused synthetic yarns disposed transversely with respect to the direction of the filaments on at least one face of the ply without passing through the ply from one face to the other, said ply containing at least 85% fibers having a modulus of elasticity in tension of at least 12000 hectobars.

3,953,642

PRESSURE SENSITIVE RECORDING SHEET

Dennis L. Forbess, and John E. Hanby, both of Vancouver, Wash., assignors to Crown Zellerbach Corporation, Camas, Wash.

Filed Jan. 9, 1974, Ser. No. 432,066
Int. Cl.² B32B *27/32*; D21F *11/00*
U.S. Cl. 428—204 **9 Claims**



1. A pressure sensitive recording sheet adapted for imaging under the pressure of a typewriter key or other writing instrument comprising at least a pair of fiber plies disposed with one in front of and normally masking the other, said one fiber ply being composed of polyolefin fibers having a surface area exceeding 1 m^2 per gm with the relatively large surface area of the fibers in said one ply resulting in light-scattering interfaces rendering said one ply opaque, said polyolefin fibers also being sufficiently flexible to compact under the pressure of a writing instrument with destruction of these light-scattering interfaces, said one ply becoming relatively transparent when subjected to the localized pressure of a writing instrument in the region where pressure is applied by reason of compaction of said fibers in said region, said other of said fiber plies being composed of wood fibers, and a colored medium distributed in said other ply normally obscured by the opacity of said one ply but made distinct by instrument pressure by reason of the relative transparency of said region produced by fiber compaction.

3,953,643

METHOD FOR COATING AND PRODUCT

Mo-Fung Cheung, Warren, and Ray A. Dickie, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1974, Ser. No. 534,926
Int. Cl.² B05D *1/38, 7/14, 7/24*
U.S. Cl. 428—220 **12 Claims**

1. In a method for coating a substrate with diverse layers of coating material which comprises applying a heat-curable first coating material to said substrate, applying a second coating material over said first coating material, after a time in excess of one minute, and heating said substrate, the improvement wherein:

I. said first coating material is applied to said substrate as a dispersion of solids in an aqueous solution of a water-soluble amine and consists essentially of about 6 to about 60 parts by weight particulate pigment and about 40 to about 94 parts by weight of thermosetting paint binder which consists essentially of

A. 100 parts by weight acrylic paint binder resins consisting essentially of

1. about 5 to about 95 parts by weight of a solution polymer which is a carboxy-functional acrylic copolymer that

a. is at least partially neutralized with said aqueous solution of water-soluble amine,

b. is soluble in said aqueous solution,

c. has average molecular weight (M_n) in the range of about 3,000 to about 20,000 and

d. has Tg in the range of -15°C. to 50°C., and

2. about 5 to about 95 parts by weight of an emulsion polymer having functionality selected from carboxy

functionality and hydroxy functionality and is an acrylic copolymer that
a. is essentially insoluble in said aqueous solution,
b. has average molecular weight (M_n) in the range of about 3,000 to about 20,000 and
c. has Tg in the range of −15°C. to 50°C., and
B. about 15 to about 35 parts by weight of an amino resin crosslinking agent for said solution polymer and said emulsion polymer,
II. said first coating material is applied to said substrate to an average thickness in the range of about 0.4 to about 1.2 mils, and
III. said second coating material is applied to said substrate as a dispersion of solids in an aqueous solution of a water-soluble amine and consists essentially of thermosetting paint binder which consists essentially of
A. 100 parts by weight acrylic paint binder resins consisting essentially of
1. about 5 to about 50 parts by weight of a solution polymer which is a carboxy-functional acrylic copolymer that
a. is at least partially neutralized with said aqueous solution of watersoluble amine,
b. is soluble in said aqueous solution,
c. has average molecular weight (M_n) in the range of about 3,000 to about 20,000 and
d. has Tg in the range of -15°C. to 50°C., and
2. about 50 to about 95 parts by weight of an emulsion polymer having functionality selected from carboxy functionality and hydroxy functionality and is an acrylic copolymer that
a. is essentially insoluble in said aqueous solution,
b. has average molecular weight (M_n) in the range of about 3,000 to about 20,000 and
c. has Tg in the range of −15°C. to 50°C., and
B. about 15 to about 35 parts by weight of an amino resin crosslinking agent for said solution polymer and said emulsion polymer,
IV. said second coating material is applied to said substrate over said first coating material to an average thickness in the range of about 0.4 to about 1.8 mils, and
V. said second coating material is heated by maintaining said substrate at a temperature in the range of about 250°F. to about 350°F. for a time in the range of about 15 to about 30 minutes.

3,953,644

POWA—METHOD FOR COATING AND PRODUCT

Melville J. Camelon, Utica, and Arend W. D. Vos, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 20, 1974, Ser. No. 534,927
Int. Cl.² B05D *1/38, 7/14, 7/24*
U.S. Cl. 428—220 **8 Claims**

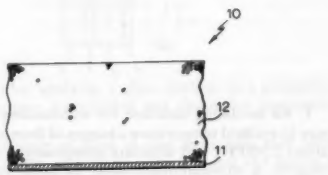
1. In a method for coating a substrate with diverse layers of coating material which comprises applying a heat-curable first coating material to said substrate, heating said substrate to at least partially cure said first coating material, applying a second coating material over said first coating material, and heating said substrate for a second time, the improvement wherein:
I. said first coating material is applied to said substrate as a dispersion of solids in an aqueous solution of a water-soluble amine and consists essentially of about 6 to about 60 parts by weight particulate pigment and about 40 to about 94 parts by weight of thermosetting paint binder which consists essentially of
A. 100 parts by weight acrylic paint binder resins consisting essentially of
1. about 5 to about 95 parts by weight of a solution polymer which is a carboxy-functional acrylic copolymer that
a. is at least partially neutralized with said aqueous solution of water-soluble amine,
b. is soluble in said aqueous solution,
c. has average molecular weight (M_n) in the range of about 3,000 to about 20,000 and
d. has Tg in the range of −15°C. to 50°C. and,
2. about 5 to about 95 parts by weight of an emulsion polymer having functionality selected from carboxy functionality and hydroxy functionality and is an acrylic copolymer. that
a. is essentially insoluble in said aqueous solution,
b. has average molecular weight (M_n) in the range of about 3,000 to about 20,000 and
c. has Tg in the range of −15°C. to 50°C., and
B. about 15 to about 35 parts by weight of an amino resin crosslinking agent for said solution polymer and said emulsion polymer,
II. said first coating material is applied to said substrate to an average thickness in the range of about 0.4 to about 1.2 mils,
III. said first coating material is heated after application to said substrate and prior to application of said second coating material to said substrate by maintaining said substrate at a temperature in the range of about 200°F. to about 350°F. for a time in the range of about 5 to about 15 minutes, and
IV. said second coating material is a particulate thermosettable mixture consisting essentially of an epoxy-functional acrylic copolymer of monoethylenically unsaturated compounds at least one of which is epoxy-functional and a cross-linking agent reactable with the epoxy functionality of said copolymer and selected from the group consisting of dicarboxylic acids and anhydrides of dicarboxylic acids, said crosslinking agent being present in an amount that provides about 0.8 to about 1.1 carboxyl groups or about 0.4 to about 1 anhydride group per epoxy group in said epoxy-functional acrylic copolymer and converts to a continuous, transparent coating upon maintaining said substrate at a temperature in the range of about 300°F. to about 350°F. for a time in the range of about 15 to about 30 minutes,
V. said second coatingg material is applied to said substrate as particulate solids to an average thickness in the range of about 0.8 to about 1.7 mils, and
VI. said second coating material is heated by maintaining said substrate at a temperature in the range of 300°F. to about 350°F. for a time in the range of about 15 to about 30 minutes.

3,953,645

PHENOLIC POLYMER, RELATED PRODUCTS AND PROCESSES THEREOF

Ernest K. Moss, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

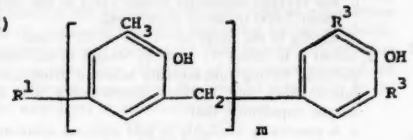
Division of Ser. No. 354,636, April 26, 1973, Pat. No. 3,876,620. This application Sept. 26, 1974, Ser. No. 509,565
Int. Cl.² B32B *3/26*
U.S. Cl. 428—310 **18 Claims**



18. A laminated structural panel having at least one facing sheet and having a cellular material adhering thereto wherein the cellular material comprised the reaction product of:

A. a methylol group containing phenolic polymer of Formula III:

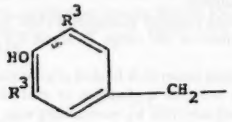
(III)



wherein:

a. R^1 is $HOCH_2$—, hydrogen or a radical of Formula IV:

(IV)



b. the R^3's are independently selected from the group consisting of $HOCH_2$—, hydrogen or a radical of Formula IV,

c. *m* is an integer from 3 to 6 inclusive,

d. the phenolic polymer has a molecular weight between 300 and 1500, and

B. phenol,

wherein the weight ratio of B:A is 1:20 to 1:5,

C. a foaming catalyst,

D. a blowing agent,

E. a surfactant.

3,953,646

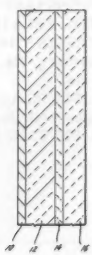
TWO-COMPONENT CERAMIC COATING FOR SILICA INSULATION

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Alexander Pechman, Mountain View, Calif., and Robert M. Beasley, Sunnyvale, Calif.

Filed June 24, 1974, Ser. No. 482,104

Int. Cl.² C04B *35/14, 43/00*

U.S. Cl. 428—332 **13 Claims**



1. An insulating structure for withstanding repeated exposure to cyclical temperature changes of from about −250°F. to about 2,500°F., said structure comprising a substrate having thereon a moisture-impervious ceramic laminate coating which comprises:

a. a barrier layer consisting essentially of fused silica, said barrier layer adhered to said substrate; and

b. an emissivity-glaze layer consisting essentially of a high silica glass, a borosilicate glass having a composition of from about 70 to about 87 wt.% SiO_2, from about 10 to about 20 wt.% B_2O_3, from about 2 to about 5 wt.% Na_2O and from about 1 to about 5 wt.% Al_2O_3, and an emissivity agent selected from the group of silicon carbide, nickel oxide, chrome oxide, cobalt oxide, nickel-chrome spinel, silicon nitride, calcined mixed oxides of iron, chrome and cobalt, and mixtures thereof with the weight ratio of high silica glass to borosilicate glass being from about 3:1 to about 19:1 and the weight ratio of high silica glass plus borosilicate glass to emissivity agent being from about 50:1 to about 4:1.

7. A method of rendering impervious to moisture a substrate which comprises sequentially applying to said substrate and firing at a temperature of from about 1,700°F. to about 2,500°F.

a. a barrier coating consisting essentially of a fused silica slip having from about 80 to about 90 wt.% solids and

b. an emissivity-glaze coating consisting essentially of a high silica glass, a borosilicate glass having a composition of from about 70 to about 87 wt.% SiO_2, from about 10 to about 20 wt.% B_2O_3, from about 2 to about 5 wt.% Na_2O, and from about 1 to about 5 wt.% Al_2O_3 and an emissivity agent selected from the group of silicon carbide, nickel oxide, chrome oxide, cobalt oxide, nickel-chrome spinel, silicon nitride, calcined mixed oxides of iron, chrome and cobalt and mixtures thereof, and an effective amount of a suspension agent in an aqueous slurry containing from about 10 to about 90 wt.% solids, with the weight ratio of high silica glass to borosilicate glass being from about 3:1 to about 19:1 and with the weight ratio of high silica glass plus borosilicate glass to emissivity agent being from about 50:1 to about 4:1.

3,953,647

GRAPHITE FIBER REINFORCED METAL MATRIX COMPOSITE

John J. Brennan, Portland, and Norman S. Bornstein, West Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Oct. 5, 1973, Ser. No. 404,084

Int. Cl. B32b *5/16*

U.S. Cl. 428—378 **5 Claims**

1. A refractory fiber reinforced composite article comprising a plurality of fibers selected from the group consisting of graphite fibers, amorphous carbon fibers and pyrolytic graphite fibers bonded together in an aluminide intermetallic matrix selected from the group consisting of nickel aluminide, cobalt aluminide and solutions and mixtures thereof, said fibers comprising approximately, by volume, 10-60% of said composite article.

3,953,648

GLASS FIBER REINFORCED ELASTOMERS

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 244,589, April 17, 1972, Pat. No. 3,869,306, which is a continuation of Ser. No. 398,305, Sept. 22, 1964, abandoned. This application Aug. 22, 1974, Ser. No. 499,755

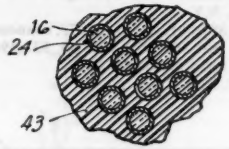
The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.

Int. Cl.² B32B *17/02, 17/04*

U.S. Cl. 428—378 **3 Claims**

1. A glass fiber bundle formed of a plurality of glass fibers, each of the glass fibers having a thin size coating on the individual surfaces thereof consisting essentially of an anchoring agent in the form of an organo silicon compound having an organic group attached directly to the silicon atom which

contains an amino group and an impregnant in the bundle to separate the glass fibers each from the other, said impregnant



consisting essentially of a combination of a resorcinol-formaldehyde resin and a rubber.

3,953,649
SELF-BONDING MAGNET WIRE AND PROCESS OF MANUFACTURING SAME

Kazuo Suzuki; Yoshiaki Hayashi, and Seiichi Nagamine, all of Otu, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 388,328, Aug. 12, 1973, abandoned. This application Oct. 17, 1974, Ser. No. 515,506
Claims priority, application Japan, Aug. 14, 1973, 48-81565
Int. Cl.² H01B *3/30;* **C08G** *69/00*
U.S. Cl. 428—383 **8 Claims**

1. A self bonding magnet wire comprising a conductor with a coating thereon, said coating comprising

A. 65 to 95 parts by weight of a first copolyamide comprising 10 to 50 weight ω-laurolactam, 20 to 35 weight percent ϵ-caprolactam, 15 to 25 weight percent hexamethylene diammonium adipate and 5 to 35 weight percent hexamethylene diammonium sebacate;

B. 35 to 5 parts by weight of a second copolyamide comprising 70 to 90 weight percent ω-laurolactam, and the remainder ϵ-caprolactam; and

C. 5 to 25 parts by weight polyhydroxypolyetherester resin.

3,953,650
STRAND MATERIAL COVERED WITH CLEAR FLAME RETARDANT COMPOSITION

Earl Salvator Sauer, Perry Hall, and William Charles Vesperman, Baltimore, both of Md., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 258,964, June 2, 1972, Pat. No. 3,868,341. This application Sept. 30, 1974, Ser. No. 510,665
Int. Cl.² H01B *3/44, 3/40*
U.S. Cl. 428—389 **10 Claims**

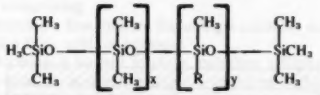
1. An electrical conductor provided with an extrudable coating of a clear flame retardant composition, the composition consisting essentially of a polymeric material consisting essentially of at least 80 per cent, by weight, of polyvinyl chloride; 10 to 55 parts, by weight, per 100 parts, by weight, of the polymeric material of a phthalate plasticizer selected from the group consisting of di(N-octyl-n-decyl) phthalate, di (N-hexyl-n-decyl) phthalate, a di-isodecyl phthalate, di-iso-octyl phthalate, a di-iso-nonyl phthalate, a di-tri-decyl phthalate and a tridecyl phthalate; 3 to 50 parts, by weight, per 100 parts, by weight, of the polymeric material of a phosphate plasticizer selected from the group consisting of triaryl phosphate and cresyl diphenyl phosphate; 2 to 5 parts, by weight, per 100 parts, by weight, of the polymeric material of a metallic stabilizer selected from the group consisting of a metallic stabilizer which includes a phosphite chelator, a barium stearate, a cadmium stearate, a barium-ethylhexoate, a barium-cadmium-laurate and a barium-cadmium myristate; 0.25 to 1.0 parts, by weight, per 100 parts, by weight, of the polymeric material of a lubricant selected from the group consisting of metallic stearate and stearic acid; 0.25 to 1.0 part, by weight, per 100 parts, by weight, of the polymeric material of an ultraviolet absorber selected from the group consisting of substituted benzophenones and substituted acryonitriles; 1 to 4 parts, by weight, per 100 parts, by weight, of the polymeric material of an epoxy resin; and 1 to 8 parts, by weight, per 100 parts, by weight, of the polymeric material of an epoxy plasticizer.

3,953,651
ACRYLIC SYNTHETIC FIBER HAVING ANIMAL HAIR-LIKE HAND

Masao Sone; Kojiro Arai, and Katsuaki Nomura, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Nov. 13, 1973, Ser. No. 415,398
Claims priority, application Japan, Nov. 14, 1972, 47-114135
Int. Cl.² B32B *27/02;* **B23B** *27/30*
U.S. Cl. 428—391 **2 Claims**

1. An acrylic synthetic fiber in which the interfiber entanglement coefficient is from 10 to 40 and the interfiber entangling force after hot water-treatment is not more than 50 mg., said fiber having a silicone resin of the formula

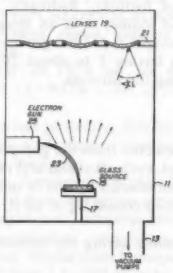


wherein R is $R'NH_2$, $R'NHR''$ or $R'NR''_2$, R' is $+CH_2\frac{}{n}$, n is 1 to 3, R'' is C_mH_{2m+1}, m is 1 to 3, x and y are positive integers and the molecular weight of the silicone resin is not more than 100,000
deposited on the fiber surface in an amount of 0.1 to 3.0 % based on the dry weight of the fiber.

3,953,652
PROCESS FOR COATING GLASS ONTO POLYMERIC SUBSTRATES

Richard Robert Addiss, Jr., Bedford, and Nedo Peter Albertinetti, Canton, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Continuation-in-part of Ser. No. 348,431, April 5, 1973, abandoned. This application Sept. 3, 1974, Ser. No. 502,578
Int. Cl.² B32B *17/06*
U.S. Cl. 428—412 **11 Claims**



1. A process for applying a glass coating to a polymeric substrate in vacuum evaporation and deposition apparatus, comprising:

a. placing a source of glass in said apparatus, said glass containing below about 0.01 percent water and having a thermal coefficient of expansion below about 45 × 10^{-7}/°C;

b. positioning said substrate at a finite distance from said source and in such a location that vaporized glass species strike the surface of said substrate to be coated at an angle of less than about 40° measured from the normal;

c. reducing the background pressure in said equipment to at least a value which provides vaporized glass species with a mean-free path not substantially shorter than said finite distance;

d. heating said substrate to an elevated temperature of between about 50° and 100°C; and,

e. vaporizing glass from said source at a rate consistent with maintaining the background pressure below the value established in step (c) until a glass coating has been deposited on said substrate to the desired thickness.

3,953,653

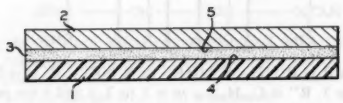
METHOD TO TREAT A POLY(ARYLENE SULFIDE) SURFACE

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1975, Ser. No. 573,183

Int. Cl.² B32B *27/06*; **C09J** *5/02*

U.S. Cl. 428—419 **20 Claims**



7. A method of bonding a first solid surface comprising poly(arylene sulfide) to a second solid surface comprising

1. contacting said first solid surface with an agent selected from the group consisting of

a. halogenated hydrocarbons and hydroxy-substituted halogenated hydrocarbons having the formula

$$X_m—R'—Y$$

wherein R′ is an $m+1$ valent saturated or olefinically unsaturated hydrocarbon radical having 1 to about 10 carbon atoms, each X is independently selected from the group consisting of hydrogen, fluorine, chlorine, bromine, and iodine, Y is selected from the group consisting of hydroxy, hydrogen, fluorine, chlorine, bromine and iodine, m is an integer and wherein at least one halogen is present per molecule,

b. organic acids having 1 to about 20 carbon atoms per molecule and having the formula

RCOOH

wherein R is selected from the group consisting of hydrogen and alkyl, cycloalkyl and aryl radicals being unsubstituted or substituted by one or more radicals selected from the group consisting of alkyl, cycloalkyl and aryl radicals,

c. hypohalogenites having the formula

MOHal

wherein M is alkali metal and Hal is a halogen atom

with the further provision that when the poly(arylene sulfide) surface consists of unfilled poly(arylene sulfide), the agent is selected from the group of agents defined above under (a) and (b) and when the poly(arylene sulfide) surface is a fiberglass-filled poly(arylene sulfide) surface, the agent is selected from the group of agents defined above under (c), and thereafter

2. adhesive-bonding said first solid surface and said second solid surface.

3,953,654

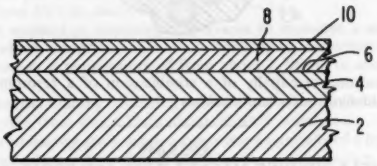
TEMPERATURE-STABLE NON-MAGNETIC ALLOY

Nathan Feldstein, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 387,601, Aug. 13, 1973, abandoned. This application Dec. 10, 1974, Ser. No. 531,396

Int. Cl.² G11C *11/02*

U.S. Cl. 428—471 **1 Claim**



1. A magnetic memory storage device comprising:

a relatively thick rough substrate of a non-magnetic material that is heat resistant to a temperature of at least about 290° C.,

a relatively thick film of a non-magnetic alloy composed of about 0.1 to about 0.7 wt. % boron, about 6 to about 16 wt. % phosphorus, and the balance nickel, on said substrate, said film having a highly polished surface,

a relatively thin film of a cobalt-phosphorous alloy magnetic material on said alloy film, and

a thin film of a cobalt oxide protective material on said film of magnetic material.

3,953,655

POLYMERS WITH IMPROVED PROPERTIES AND PROCESS THEREFOR

Robert A. Steinkamp, and Thomas J. Grail, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 240,494, April 3, 1972, Pat. No. 3,862,265, which is a continuation-in-part of Ser. No. 132,838, April 9, 1971, abandoned. This application July 10, 1974, Ser. No. 487,069

Int. Cl.² B32B *27/06, 27/34, 27/36*; **C08F** *255/02*

U.S. Cl. 428—474 **9 Claims**

1. A laminate comprising a layer of a grafted polymeric composition, prepared from a base polymer, comprising from 0.02 to 20 weight percent of grafted acrylic acid or glycidyl acrylate monomer and having a melt flow rate of from 3 to 1000 and at least 50% higher than said base polymer and a die swell of at least 0.05 unit less than that of said base polymer firmly self-bonded to a layer of nylon.

3,953,656

MAGNETIC RECORDING MEDIUM AND PREPARATION THEREOF

Yasumichi Tokuoka; Shinji Umeki, and Yuichi Kubota, all of Tokyo, Japan, assignors to TDK Electronic Company, Tokyo, Japan

Filed Feb. 28, 1974, Ser. No. 446,740

Claims priority, application Japan, Mar. 20, 1973, 48-31487

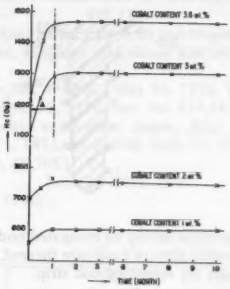
Int. Cl.² H01F *10/02*

U.S. Cl. 428—539 **1 Claim**

1. A magnetic recording tape, which comprises:

a magnetic recording layer containing magnetic iron oxide having a cobalt content of 0.5 – 10 weight % and a ratio of Fe^{+2}/Fe^{+3} of 0.1 – 0.35, which is magnetized to a residual magnetization of at least 85% of the saturated magnetization, and characterized by a width of the half peak height of the differential curve of the residual magnetization curve which is less than 60% of the width of the half peak height of the differential curve of a non-treated conventional iron-cobalt magnetic oxide magnetic re-

cording layer, and further characterized by a slope of at least about 325 of the line in a graph obtained from a plot



of the coercivity in oersteds (Hc) of said magnetic recording layer versus % cobalt content.

3,953,657

METHOD FOR COATING PARTICULATE SOLIDS WITH POLYMERS

Tadashi Yamaguchi; Takayuki Ono, both of Sendai; Hiroshi Hoshi, Narashino; Michio Hirakawa, and Isao Watanabe, both of Ichikawa, all of Japan, assignors to Mitsui Toatsu Kagaku Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1974, Ser. No. 437,393

Claims priority, application Japan, Jan. 29, 1973, 48-11116; Feb. 5, 1973, 48-14520

Int. Cl.² B32B *17/02, 19/00*

U.S. Cl. 428—406 **6 Claims**

1. A method for coating the surface of particulate solids with a polymer, characterized in that a solid selected grom the group consisting of glass particles, abrasive particles and sand particles are brought into contact in an aqueous or alcoholic medium with a vinyl monomer in the presence of a polymerization initiator consisting essentially of bisulfite ions to form a polymer on the surface of said particulates.

3,953,658

COPPER COATINGS ON SHAPED PLASTIC SUPPORTS

Wilhelm Brandt, Wertach, and Irmgard Bindrum, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 5, 1972, Ser. No. 312,269

Claims priority, application Germany, Dec. 8, 1971, 2160822

Int. Cl.² B05D *5/12*

U.S. Cl. 428—458 **4 Claims**

1. A process for metallizing the surface of a shaped plastic support selected from the group consisting of polyesters, polyolefins, polyimides and acrylonitrile-butadiene-styrene copolymers comprising

producing on said surface a conductive layer of a surface resistance in the range of about 1 to less than 10^{12} ohms by sensitization with a noble metal salt, activation with a reducing agent to produce noble metal nuclei and subsequent deposition of copper by contacting the said surface with an electroless copper bath at a temperature and for a period sufficient to produce a copper layer having a surface resistance in the stated range,

and vapor-depositing copper in a high vacuum on said conductive surface to form a coating on the shaped plastic support.

4. A shaped plastic support having a copper coating thereon produced according to the process of claim 1.

3,953,659

THERMAL PAPER COATING

James K. Truitt, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed July 15, 1974, Ser. No. 488,340

Int. Cl.² B41M *5/18*

U.S. Cl. 428—511 **6 Claims**

1. A heat-sensitive print sheet comprising a thin flexible sheet material and including a visibly heat sensitive layer comprising:

a. a heat sensitive color producing formulation including a normally solid iron salt of a fatty acid and a diphenolic compound;

b. a binder comprising cellulose acetate;

c. acetone as a solvent for the binder; and

d. water as a non-solvent blush material for the binder, wherein said acetone is present in the range of about 1000 through about 1500 parts, and the water is present in the range of about 100 to about 300 parts, per 100 parts cellulose acetate.

4. A process for the production of a heat-sensitive print sheet comprising:

a. forming a first mixture including a normally solid iron salt of a fatty acid, in acetone;

b. forming a second mixture including a diphenolic compound, in acetone, wherein a cellulose acetate binder is dissolved in at least one of said first and second mixtures;

c. forming a third mixture including acetone and water, wherein said acetone is present in the range from about 1000 to about 1500 parts, and the water is present in the range from about 100 to about 300 parts, per 100 parts of cellulose acetate;

d. mixing said first, second and third mixtures to form a fourth mixture;

e. coating said fourth mixture onto a flexible sheet material which is insoluble in acetone; and

f. drying the coated flexible sheet material.

3,953,660

SURFACE PROTECTIVE FILM FOR PLASTICIZED POLYVINYL CHLORIDE SUBSTRATES

Tadashige Ishida, Tokyo, Japan, assignor to Tamapoly Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1974, Ser. No. 456,184

Int. Cl.² B32B *27/08, 27/30*

U.S. Cl. 428—518 **10 Claims**

1. An adhesive surface protective film for polyvinyl chloride substrate containing a plasticizer, comprising, an adhesive layer of 10–100μ in thickness,

said adhesive layer containing 100 parts by weight of a vinyl polymer selected from the group consisting of ethylene-vinylacetate copolymer, ethylene-ethylacrylate copolymer, ethylene-propylene copolymer, ethylene-vinylalcohol copolymer, vinylalcohol homopolymer and polyvinylbutyral; and from 1 to 100 parts by weight of chlorine containing olefin polymer selected from the group consisting of chloroprene, polyvinyl-chloride, polyepichlorohydrin, vinylchloride-vinylacetate copolymer, vinylchloride-vinylether copolymer, vinylchloride-vinylidene chloride copolymer, the graft polymer of vinylchloride and ethylene-vinylacetate copolymer and a mixture thereof, chlorinated polyethylene, chlorinated polypropylene, and chlorinated polyvinylchloride,

said olefin polymer having a solubility parameter of between 0.8 and 11.0, and

said adhesive layer is applied to a substrate of polyvinylchloride of 10 to 100μ in thickness.

3,953,661

EXTRUSION APPARATUS, PROCESS AND ARTICLE

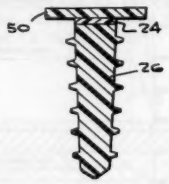
Willard Q. Gulley, Concord, Tenn., assignor to Vinylex Corporation, Knoxville, Tenn.

Filed Jan. 3, 1974, Ser. No. 430,487
Int. Cl.[2] B32B 7/00, 3/30
U.S. Cl. 428—542 8 Claims

1. A unitary extruded article having a stable, separable stripping portion for producing controlled fracturing in concrete masses comprising:

an extruded body having top and bottom portions formed from a thermoplastic resin and an intermediate portion forming a separable tear section between said top and bottom portions, and

said intermediate portion being of a width substantially equal to that of the contiguous bottom and top portions and being formed of a thermoplastic resin having admixed therewith at least 150 parts per 100 parts of said thermoplastic resin of a tear strength reducing agent selected from the group consisting of a plasticizer for said thermoplastic resin and a filler whereby to permit the stripping of said top portion from said article, and



said bottom portion having an elongated body and a plurality of projecting ribs on each side thereof, and extending longitudinally the length of said strip.

ELECTRICAL

3,953,662
SEALED CONTAINER HOUSING A MECHANICAL FILTER

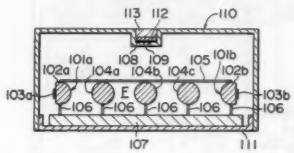
Toshio Nagashima; Ichiro Imaguchi, and Shigeo Igarashi, all of Tokyo, Japan, assignors to Kokusai Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 472,987, May 24, 1974. This application Dec. 30, 1974, Ser. No. 537,313

Claims priority, application Japan, June 11, 1973, 48-65589; June 11, 1973, 48-65590; June 11, 1973, 48-65591; June 15, 1973, 48-70837[U]

Int. Cl.² H05K *5/06*

U.S. Cl. 174—17.05 **3 Claims**



1. A container housing a mechanical filter, comprising a metal casing having top, bottom and end walls accommodating a mechanical filter therein; a recess formed in one of the walls of said metal casing and provided with an aperture therethrough; adhesive means disposed on the surface of said recess in such a manner as to cover said aperture, said adhesive means being adapted to permit the air within said casing to be withdrawn from said casing through said aperture and through a clearance between said adhesive means and the surface of said recess so that said casing may be evacuated, said adhesive means being also adapted to be urged into air-tight contact with the surface of said recess to hermetically seal said aperture due to the difference in pressure between the outside and the inside of said casing after the latter has been evacuated; and hermetic sealing means provided on said adhesive means within said recess after said casing has been evacuated.

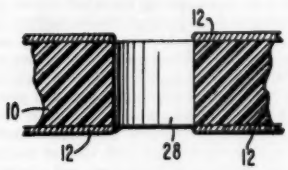
3,953,663
VACUUM-HEAT TREATED PRINTED CIRCUIT BOARDS

William G. Kelhm, Jr., Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. Nos. 794,686, Jan. 28, 1969, Pat. No. 3,708,876, and Ser. No. 2,019, Jan. 12, 1970, Pat. No. 3,755,890, which is a continuation-in-part of Ser. No. 794,686,. This application Jan. 2, 1973, Ser. No. 320,307

Int. Cl.² H05K *1/02, 3/22*

U.S. Cl. 174—68.5 **5 Claims**



1. A high vacuum baked circuit board formed of a thermoset plastic composition and bearing electric conductive elements on at least one surface thereof, said board being substantially free of all material therein vaporizable at temperatures up to approximately 450°F.

3,953,664
PRINTED CIRCUIT BOARD

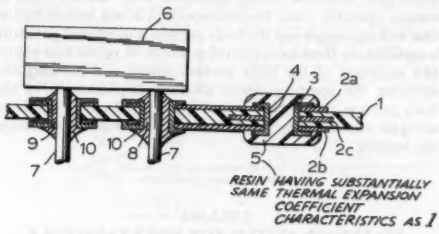
Eiichi Tsunashima, Hirakata, Japan, assignor to Matsushita Electric, Wireless Research Laboratory, Osaka, Japan

Filed Oct. 25, 1974, Ser. No. 518,219

Claims priority, application Japan, Oct. 26, 1973, 48-120878; Oct. 29, 1973, 48-121918

Int. Cl.² H05K *1/18*

U.S. Cl. 174—68.5 **3 Claims**



1. In a printed circuit board, the combination of an electrically insulating board which is made of a base containing synthetic resin and having at least two conductors, one conductor being on one surface of said circuit board and the other conductor being on the opposite surface of said circuit board, said board having a plurality of holes therethrough, a conductive layer extending through one hole and covering at least part of the surface of said conductors connecting said conductors on both the surfaces of said circuit board through said one hole, and a filler composed of electrically insulating resin which fills said one hole and covers the surface of said conductive layer for preventing breakage of the conductive path through the hole containing the filler, the filler of insulating resin having a thermal coefficient of expansion characteristics which are substantially the same thermal coefficient of expansion characteristics as the material of the insulating board, another of said holes being soldered, the two holes forming redundant electrical connection paths between said conductors on both surfaces of said board, whereby undesirable thermal shock owing to the soldering is avoided in the hole filled with said resin.

3,953,665
BUSHINGS, GROMMETS OR LIKE DEVICES

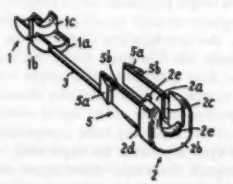
John Holt Nicholson, Ferndown, England, assignor to Plastic Seals Limited, England

Filed Oct. 15, 1974, Ser. No. 514,800

Claims priority, application United Kingdom, Oct. 15, 1973, 48030/73

Int. Cl.² F16L *5/00;* **H01B** *17/26*

U.S. Cl. 174—153 G **8 Claims**



1. A bushing comprising a body portion which at least partially defines an elongate member-receiving passage extending generally longitudinally through the bushing, the body

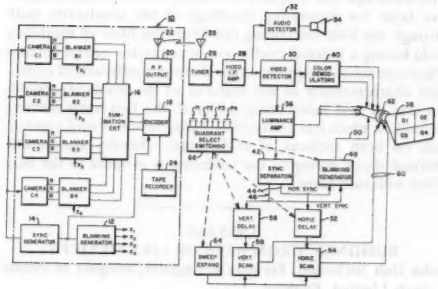
portion being provided with first locking means, operable to releasably lock the body portion in an operative position within an aperture in a plate-like member when the bushing is inserted generally longitudinally into the aperture, in which position the bushing is operable to locate an elongate member, when received in and extending through said passage, with respect to the plate-like member, the leading end of the body portion, in the generally longitudinal direction of insertion of the body portion into the aperture in the plate-like member, including at least two blade-like members extending along opposite sides of, and partially defining, said passage, said blade-like members being provided with second locking means, operable when the body portion is not locked by the first locking means and the body portion is displaced generally longitudinally from its operative position, to retain said blade-like members of the body portion within and partially obstructing the aperture whilst allowing displacement of the body portion within the aperture to a position in which an elongate element may be assembled to or disassembled from the bushing.

3,953,666

TELEVISION SYSTEM FOR SIMULTANEOUSLY TRANSMITTING AND RECEIVING A PLURALITY OF INDEPENDENT PICTURES ON A SINGLE CARRIER SIGNAL

James W. H. Justice, Murrysville, and George F. Newell, Pittsburgh, both of Pa., assignor to Westinghouse Electric, Corp., Pittsburgh, Pa.

Filed May 25, 1973, Ser. No. 364,161
Int. Cl. H04n 7/00
U.S. Cl. 178—5.6 **4 Claims**



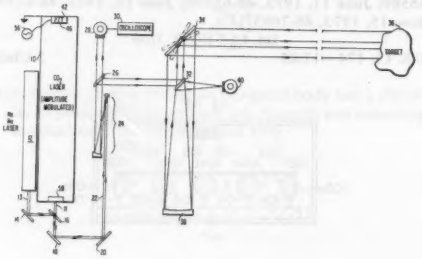
1. An apparatus for receiving a plurality of separate pictures or scenes on a single television carrier signal such that a different scene appears in each quadrant of a single television receiving tube, the combination of means for detecting frames of video signals wherein each frame includes four different scenes in the four quadrants of a single television receiving tube, means coupled to said detecting means for blanking out all but that portion of the video signal which when displayed on the face of the receiving tube comprises one of said four quadrants, a sync separator for separating vertical and horizontal sync signals from said video signal, means for delaying both the vertical and horizontal sync signals, means for recombining the delayed vertical and horizontal sync pulses with the blanked video signal, means for recombining a radio-frequency carrier signal with the recombined video signal and blanking pulses, and means for applying the thus-modulated signal to the terminals of a television receiver.

3,953,667

PASSIVE AND/OR ACTIVE IMAGING SYSTEM

Allen C. Layton; Werner G. Zinn, Jr., both of Orlando; Antonio J. Mendez, Winter Park; Robert E. Howle, Orlando, and Thomas E. Bayston, Maitland, all of Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Filed June 28, 1974, Ser. No. 484,028
Int. Cl.² H04N 7/02
U.S. Cl. 178—6 **13 Claims**



7. In the method of sensing and displaying the infrared radiation image of a scene, the improvement comprising the steps of:

a. illuminating the scene with a coded infrared laser beam;

b. simultaneously sensing the infrared radiation and reflected laser energy images of the scene with a common detector and producing a composite signal including both infrared and coded laser image signals;

c. separating the coded laser signals from the infrared image signals; and

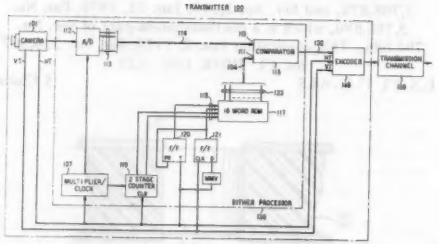
d. selectively applying the separated signals to a display device, so that either or both images are visibly displayed.

3,953,668

METHOD AND ARRANGEMENT FOR ELIMINATING FLICKER IN INTERLACED ORDERED DITHER IMAGES

Charles Norris Judice, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 27, 1975, Ser. No. 580,910
Int. Cl.² H04N 7/12
U.S. Cl. 178—6 **21 Claims**



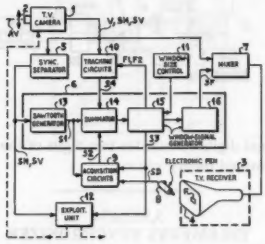
18. In a method for presenting a dithered image in a plurality of interlaced scan lines, said image comprising a plurality of rows of dithered image cells each of which has one of two predetermined intensities, the improvement comprising the step of controlling the the intensity presented along each of said scan lines in accordance with the intensities of the cells in a selected two adjacent ones of said rows.

3,953,669

VIDEO TRACKING SYSTEM

Georges Saccomani, and Leonidas Symaniec, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 30, 1974, Ser. No. 502,205
Claims priority, application France, Aug. 31, 1973, 73.31521
Int. Cl.² H04N 7/18
U.S. Cl. 178—6.8 10 Claims



1. A video tracking system comprising:

a television camera adapted to be trained upon an area of observation containing a target to be tracked;

a television receiver provided with a monitoring screen and connected to said camera for receiving therefrom an input signal to display on said screen a picture of said area of observation including an image of said target, said input signal including synchronizing pulses for controlling a periodic deflection of an electron beam in said receiver in two mutually orthogonal sweep directions;

window-generating means connected to said receiver for delineating on said screen a rectangular window with sides extending in said sweep directions, said window-generating means including a source of scanning voltage controlled by said synchronizing pulses and gating means for passing selected portions of said scanning voltage to said receiver;

manually operable acquisition means adapted to control said source for modifying said scanning voltage to align said window with a desired target image on said screen; and

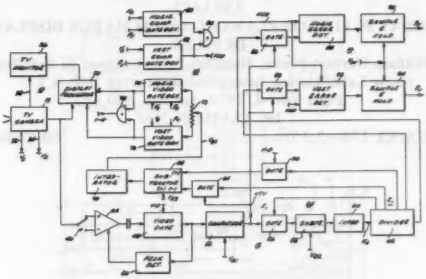
tracking means connected between said camera and said source for keeping the energy center of said target image substantially coincident with the geometrical center of said window upon substantial alignment thereof by said acquisition means, said tracking means including a first pair of measuring circuits responsive to a first pair of timing pulses from said gating means for detecting the energy content of said input signal in respective halves of a beam sweep in one of said directions across said window, a second pair of measuring circuits responsive to a second pair of timing pulses from said gating means for detecting the energy content of said input signal in respective halves of a beam sweep in the other of said directions across said window, first comparison means connected to said first pair of measuring circuits for generating a first error signal proportional to a difference in said energy content on a beam sweep in said one of said directions, second comparison means connected to said second pair of measuring circuits for generating a second error signal proportional to a difference in said energy content on a beam sweep in said other of said directions, and circuitry for applying said error signals to said source for further modifying said scanning voltage.

3,953,670

ADAPTIVE VIDEO CENTROID TRACKER

Paul R. Prince, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 28, 1970, Ser. No. 102,247
Int. Cl.² H04N 7/00; G01J 1/20
U.S. Cl. 178—6.8 14 Claims



1. A system for determining the relative angular position of an object, said system comprising:

transducer means for sequentially producing first signals representative of the relative intensity of increments of area of the received image of said object and a surrounding scene;

means for adaptive gating said first signals as a function of the image area, to form second signals;

means for processing said second signals to form third signals the time duration of which is representative of the time duration of associated increments of area of said image and the amplitude of which is an inverse function of the image area; and

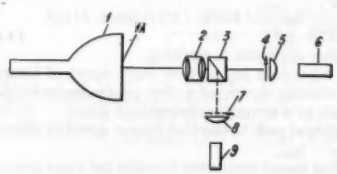
error detector means for processing said third signals to provide output signals representative of the relative angular position of the centroid of said image.

3,953,671

FEED-BACK CIRCUIT FOR CONTROLLING THE DISTANCE BETWEEN VERTICALLY DISPLACED SCANNING RASTERS PRODUCED BY A CATHODE RAY TUBE

John David Millward, Hitchin, England, assignor to The Rank Organisation Ltd., London, England

Filed Sept. 27, 1974, Ser. No. 509,961
Claims priority, application United Kingdom, Sept. 27, 1973, 45273/73
Int. Cl.² H04N 5/36
U.S. Cl. 178—7.2 5 Claims



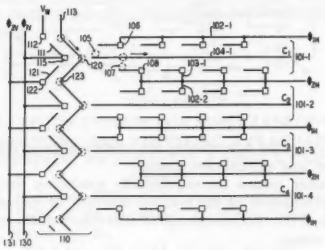
1. A flying spot film scanning system comprising a cathode ray tube for producing a pair of vertically displaced scanning rasters corresponding to odd and even television fields, an optical system for focussing an image of the rasters in the plane of a film to be scanned, means for diverting a proportion of the light travelling between the cathode ray tube and the film into a secondary light path to form a secondary image of the rasters, means for measuring the vertical position of each

secondary raster image, means for comparing the measured vertical positions of the secondary raster images to provide a control signal dependent upon the vertical distance between the secondary raster images, and a feed-back circuit coupled to the vertical deflection circuit of the cathode ray tube to adjust the vertical distance between the rasters in accordance with the control signal.

3,953,672
GRAY SCALE FOR PLANAR GAS DISCHARGE DISPLAY DEVICES

William Herbert Ninke, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 4, 1974, Ser. No. 520,612
Int. Cl.² H04N 5/44
U.S. Cl. 178—7.3 D **10 Claims**



1. A graphical display system comprising

at least one plasma discharge shift register having LM ordered stable discharge locations, consecutive sets of L of said locations defining individual resolution elements,

means for initiating a glow discharge at a first discharge location in each of said shift registers,

means for propagating a glow discharge through successive locations in said shift registers, said means for propagating comprising means for time modulating said propagation so that a discharge is maintained at one or more discharge locations in a resolution element for a controlled period relative to that at which a glow is maintained at the remaining locations in that resolution element.

3,953,673
DIGITAL DATA SIGNALLING SYSTEMS AND APPARATUS THEREFOR

Richard Munro Dorward, Coventry, England, assignor to The General Electric Company Limited, London, England

Filed Oct. 16, 1974, Ser. No. 515,430
Claims priority, application United Kingdom, Oct. 16, 1973, 48145/73
Int. Cl.² H03K 13/24; H04L 25/00
U.S. Cl. 178—68 **14 Claims**

9. Coding apparatus comprising:

A. an input path to carry an input signal of binary form constituting signals of a first predetermined value and signals of a second predetermined value,

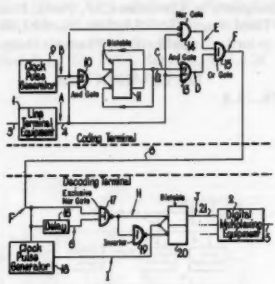
B. an output path to carry an output signal of binary form, and

C. coding means connected between the input path and the output path to derive from each input signal binary digit a pair of coded signal binary digits which are fed to the output path,

I. each pair of coded signal binary digits

i. for the first input signal binary digit of said first predetermined value being two coded signals digits of different predetermined binary values, and

ii. for the input signal binary digit of said second predetermined value being alternately two pairs of coded signal digits of which the first pair of coded signal digits constitutes two digits of the same predetermined binary value and the second pair of coded

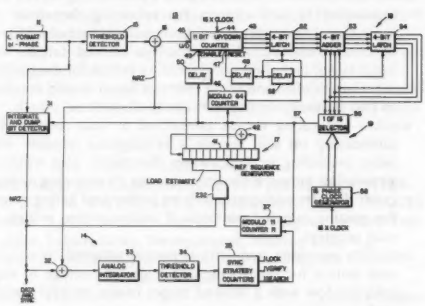


signal digits constitutes two digits of the other predetermined binary value.

3,953,674
TELEMETRY SYNCHRONIZER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Carroll T. Pardoe, Woodbine, Md.

Filed Apr. 4, 1975, Ser. No. 565,290
Int. Cl.² H04L 7/00
U.S. Cl. 178—69.5 **18 Claims**



1. Apparatus for phase locking an L format biphase input signal having a pseudorandom sequence comprising a source of said input signal, a feedback shift register for deriving a non-return to zero output signal having the same sequence as the input signal, means for comparing said input and output signals to derive a binary error signal having first and second levels respectively indicative of the input and output signals having the same and different binary levels, filter means responsive to the error signal for deriving a control signal, a clock source coupled to a clock input of the shift register, and means for controlling the occurrence time of transitions derived from the clock source coupled to the clock input in response to the control signal.

3,953,675
AUDIO SPEAKER SYSTEM

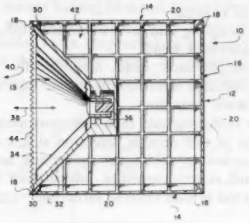
Burton A. Babb, Dallas, Tex., assignor to Babbco, Ltd., Dallas, Tex.

Filed May 8, 1972, Ser. No. 250,899
Int. Cl.² H04R 1/02; G10K 11/00
U.S. Cl. 179—1 E **10 Claims**

1. A loud speaker system comprising:

a loud speaker having a moving member for generating acoustic energy;

enclosure means forming, together with the moving member, a substantially air-tight enclosure having a predetermined volume, the enclosure means including at least one edge supported panel comprised of a skin means and stiffening means for stiffening the panel; and



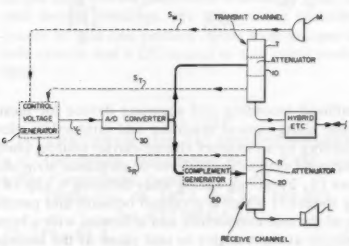
said stiffening means providing sufficient stiffness to said skin means to substantially reduce the transmission of longer wave length acoustic energy and providing edge supported sub-panels having a sufficiently small mass per unit area to transmit shorter wave length acoustic energy.

3,953,676

DIGITAL CONTROL OF A LOUDSPEAKING TELEPHONE SYSTEM

Russel William Brown, Ottawa, Canada, assignor to Northern Electric Company, Limited, Montreal, Canada

Filed Dec. 12, 1974, Ser. No. 531,823
Int. Cl.² H04M 9/08
U.S. Cl. 179—1 HF **13 Claims**



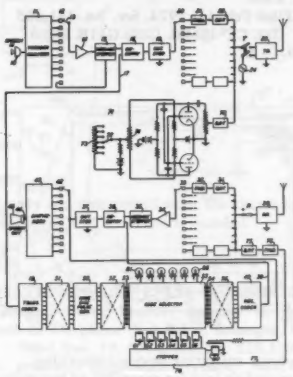
6. In a loudspeaking telephone system having a transmit and a receive channel and means for generating a control voltage in response to signal levels in said transmit and receive channels, the improvement comprising analog-to-digital converter means responsive to said control voltage for coding the same into a digital representation; means responsive to the analog-to-digital converter means for generating the complement representation of said digital representation; and two variable attenuators, one adapted to respond to said digital representation and the other adapted to respond to the complement representation, a predetermined one of the two attenuators being in the receive channel and the other in the transmit channel.

3,953,677

KEY SIGNALING SYSTEM WITH MULTIPLE PULSE GENERATORS

Danforth K. Gannett, Mountain Lakes, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 10, 1945, Ser. No. 592,964
Int. Cl.² H04K 1/02
U.S. Cl. 179—1.5 R **12 Claims**



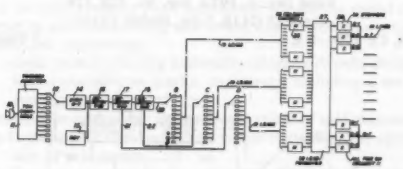
1. In a secret signaling system, means at a station for providing a plurality of different keys for use one at a time for enciphering signals to be sent from said station, means at said station when transmitting for sending a concomitant indication identifying the particular key that is in use in transmitting, means at a station when receiving secret signals and key indications from another station for providing a plurality of different keys which are duplicates of those provided at the distant sending station, means responsive to the received key indication for automatically selecting the appropriate key for deciphering the received secret signals, and means for deciphering said received secret signals by means of said selected key.

3,953,678

SPEECH COMPONENT KEY SIGNALING SYSTEM WITH CODE COMBINATIONS

Danforth K. Gannett, Mountain Lakes, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 10, 1945, Ser. No. 592,965
Int. Cl.² H04L 9/02
U.S. Cl. 179—1.5 R **9 Claims**



1. In secret telephony, means to analyze input speech waves into low frequency speech-defining currents simultaneously existent in a plurality of separate circuit paths, means to add secret key currents to each speech-defining current to produce summation currents, means for periodically measuring the magnitude of each summation current, means to indicate the magnitudes of said currents by code combinations of pulses of equal number having fixed amplitudes, means to impress each pulse of the code combinations existing at any

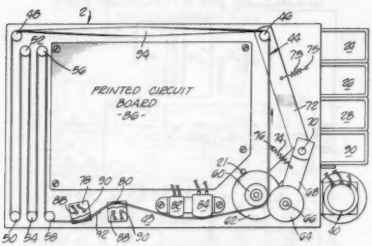
one time upon a different individual line, and means to continually alter the order of the lines upon which said pulses are impressed.

3,953,679

TELEPHONE ANSWERING DEVICE UTILIZING MOBIUS LOOP ACTIVATING SWITCH

Neal Buglewicz, Rolling Hills, Calif., assignor to Phone-Mate, Torrance, Calif.

Filed Feb. 11, 1974, Ser. No. 441,505
Int. Cl.² H04M *1/64*; G11B *15/06*
U.S. Cl. 179—6 R **9 Claims**



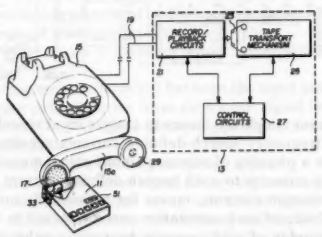
1. A telephone answering device comprising:
a. A first recording tape for recording an incoming message;
b. a play back head and a record-erase head associated with said first recording tape;
c. a second recording tape for recording and playing back a pre-recorded message, said second recording tape comprising a closed loop said closed loop having a twist therein so as to form a Mobius loop, said pre-recorded message recorded on one surface of said loop;
d. a play back head and a record-erase head associated with said second recording tape;
e. a tone generating switch, said tone generating switch activated by a switching means associated with said second recording tape on one revolution of said second recording tape; and
f. a power shut off switch, said power shut off switch activated by said switching means associated with said second recording tape on a second revolution of said second recording tape.

3,953,680

REMOTE CONTROL TRANSCRIBING DEVICE

Joseph J. Zimmermann, Elm Grove, Wis., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Dec. 4, 1974, Ser. No. 529,328
Int. Cl.² G11B *5/86*; H04M *11/10*
U.S. Cl. 179—6 E **7 Claims**



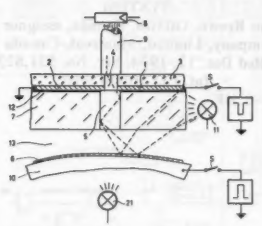
1. Remote control transcribing apparatus for controlling a remotely located tape recorder apparatus and retrieving message information therefrom wherein said tape recorder apparatus is operable in a high speed rewind mode and said transcribing apparatus includes tape transport means for transporting a magnetic recording tape in a forward direction and a reverse direction past a record/playback head, said transcribing apparatus comprising:
means for generating a tone of predetermined frequency and selectively applying said tone to said remote tape recorder to switch said remote tape recorder into said high speed rewind mode to play back said message information in reverse;
means for coupling said reverse message information to said record/playback head,
said record/playback head magnetically recording said reverse message information on said tape at high speed in said forward direction;
means for switching said tape transport means to transport said tape in said reverse direction at low speed; and
means coupled to said record/playback head for playing back said reverse message information as said tape is transported in said reverse direction.

3,953,681

COMBINED RECORDING AND SCANNING DEVICE FOR FACSIMILE TRANSMISSION

Jürgen Schramm, Norderstedt, and Gerhard Krekow, Schenefeld, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 2, 1974, Ser. No. 485,205
Claims priority, application Germany, July 4, 1973, 2333952
Int. Cl.² H04N *1/24*
U.S. Cl. 178—6.6 A **7 Claims**



1. Combined recording and scanning device for facsimile transmission using optical scanning and contactless electrostatic recording by an indirect charge carrier source, comprising an electrode system in the form of co-planar strip-shaped conductors (1, 2) having facing ends defining a gap (4), an insulating sheet (7) which is arranged beneath and parallel to the plane of the said conductors and is formed with a bore (5) which extends at right angles to said plane at the location of the gap (4), and a back electrode (10) which is disposed beneath the sheet and spaced therefrom by a distance (13), the device further including an electrooptical scanning element (8) adapted to intercept light incident on the gap (4) through the bore.

3,953,682

LOOP CURRENT DETECTOR

Douglas Lee Daniels, Irvine, and Garrold W. Ochs, Orange, both of Calif., assignors to The Anaconda Company, New York, N.Y.

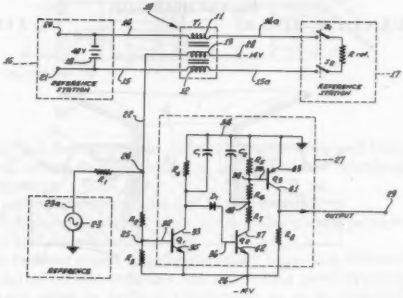
Filed Nov. 11, 1974, Ser. No. 522,859
Int. Cl.² H04M *3/00*
U.S. Cl. 179—18 FA **6 Claims**

1. In a loop current detector,

a. a saturable reactor having first, second and third windings, the first and second windings connected in a loop circuit to pass DC current,

b. resistance connected with the third winding to form therewith a voltage divider, and an oscillator having an AC output connected with the divider, characterized in that the AC voltage drop across the third winding is relatively high when no DC current flows through said loop circuit, and said drop is relatively low when DC current flows through said circuit, and

c. switching means having first and second modes of operation with associated outputs, and connected with said voltage divider to be responsive to said oscillator output when said AC voltage drop is relatively high to be switched into said first mode of operation with one associated output, and to be non-responsive to said oscillator output when said AC voltage drop is relatively low to be switched into said second mode of operation with a second associated output, said switching means including semiconductor devices one of which is connected with said divider at a point between said resistance and said third winding, there also being a source of DC voltage connected with said divider and said switching means to establish said one output at a corresponding voltage level,



d. one portion of said loop circuit connected with certain ends of the first and second windings and another portion of the loop circuit connected with other ends of the first and second windings, the loop circuit including switch means in said one portion of the loop to open and close said circuit, and a DC source in said other portion of the loop.

3,953,683

INTERRUPTER FOR TELEPHONE SYSTEMS

Bruce C. Gabrielson, Huntington Beach, Calif., assignor to San/Bar Corporation, Santa Ana, Calif.

Filed Oct. 29, 1974, Ser. No. 518,583

Int. Cl.² H04M *3/02*

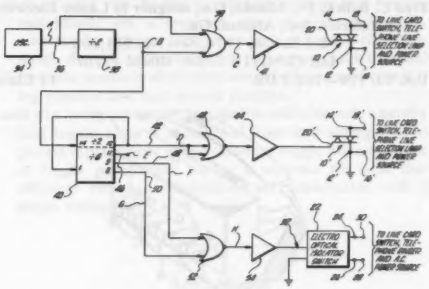
U.S. Cl. 179—84 A **12 Claims**

1. In an interrupter for alternately enabling and blocking the flow of current in the circuits between a plurality of pairs of terminals to control the visual and audible indicators in key telephone sets, the combination which comprises:

switching means individually connected between each pair of terminals, each switching means including a control circuit and being arranged to permit the flow of current in the circuit between the respective pair of terminals in response to the application of a first control signal to the control circuit thereof and to block the flow of current in the respective circuit between the terminals in the absence of the first control signal;

oscillator means for generating an a.c. reference signal having a preselected frequency; and

control means coupled between the oscillator means and each of the switching means for applying a control signal to each switching means at a predetermined frequency and for a predetermined time period for controlling the frequency and time period when the circuit between each respective pair of terminals is enabled.


OSC.
÷ f
TO LINE CARD SWITCH, TELEPHONE LINE SELECTION LAMP AND RINGER SOURCE
TO LINE CARD SWITCH, TELEPHONE LINE SELECTION LAMP AND RINGER SOURCE
ELECTRO OPTICAL ISOLATOR CIRCUIT
TO LINE CARD SWITCH, TELEPHONE RINGER AND AC POWER SOURCE

3,953,684

STATIC MEMORY PULSE TRANSMITTER

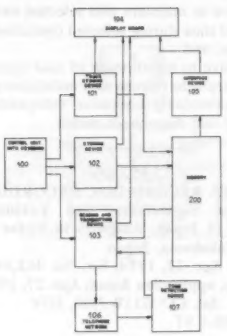
Patrick Jossier, Paris, France, assignor to Peritel, Peripheriques de Telephone (S.A.R.L.), Boulogne, France

Filed Nov. 19, 1974, Ser. No. 525,109

Claims priority, application France, Nov. 26, 1973, 73.42024

Int. Cl.² H04M *1/26*

U.S. Cl. 179—90 K **8 Claims**



1. A static memory pulse transmitter for storing coded call numbers and transmitting said coded call numbers on a telephone line comprising

a static memory having a plurality of memory cells divided into a plurality of tracks, each track including a set of memory cells;

means for addressing a preselected track of said memory;

a keyboard for inserting numbers and controlling the operation of said means;

a first counter operatively associated with a track in which a call number is to be stored, said first counter being incremented in response to each actuation of a digit on said keyboard;

a second counter operatively associated with a track from which a call number is to be read, said second counter being incremented at a rate not greater than the conventional rate of dial pulses on a telephone line; and

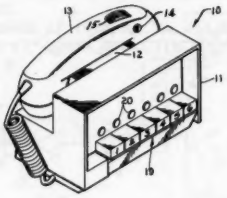
comparison means for determining that the rate of incrementing said second counter is not greater than the rate of incrementing said first counter.

3,953,685

MULTIPLE-CHANNEL DICTATE STATION APPARATUS WITH AUTOMATIC RELEASE OF SELECTED CHANNEL

Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Electronic Laboratories, Inc., Atlanta, Ga.

Filed Nov. 6, 1974, Ser. No. 521,208
Int. Cl.² G11B 15/06; H04M 1/10
U.S. Cl. 179—100.1 DR 11 Claims



1. Multiple line control apparatus for selective interconnection with any one of plural available circuits, comprising:

a circuit utilization means which is selectively operable;

a plural number of separately selectively actuatable switch means each of which is operative to connect a corresponding input circuit to said circuit utilization means;

disconnect means operatively associated with each of said switch means to disconnect any previously-actuated one of said switch means in response to actuation of another one of the switch means, so that selection of a particular said circuit causes any previously-selected circuit to be relinquished;

means operative to maintain said selected switch means in said actuated state during selected operation of said utilization means; and

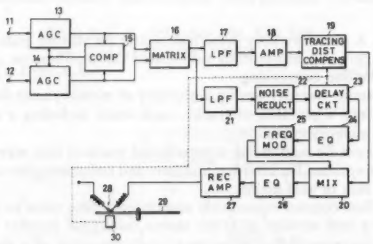
means responsive to termination of said operation of said utilization means to release said maintaining means from actuation maintaining operation independently of said operation of said disconnect means.

3,953,686

MULTICHANNEL RECORD DISC RECORDING SYSTEM

Kohei Sasamura, Sagamihara, and Yukinobu Ishigaki, Yamato, both of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 22, 1974, Ser. No. 462,648
Claims priority, application Japan, Apr. 27, 1973, 48-48809
Int. Cl.² G11B 3/00, 3/74
U.S. Cl. 179—100.4 ST 11 Claims



1. A multichannel record disc recording system comprising:

a plurality of automatic gain control means for respectively controlling the gains of signals of a plurality of channels to produce respective output signals;

operational means responsive to the output signals of said automatic gain control means to produce, as output, a sum signal and a difference signal;

means for producing control signals responsive to the phases and levels of the output signals of said automatic gain control means;

means for applying said control signals to said automatic gain control means; and

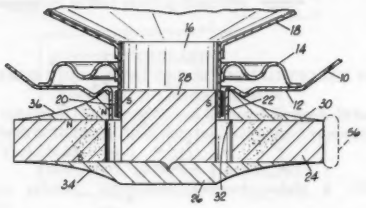
means for angle modulating the output difference signals of said operational means and multiplexing the output difference signal on the output sum signal of the same operational means thereby to record the multiplexed difference and sum signals on a record disc.

3,953,687

MAGNETIC STRUCTURE FOR MOVING VOICE COIL LOUDSPEAKER

Gordon S. Carbonneau, Grand Rapids, Mich., assignor to Carbonneau Industries, Inc., Grand Rapids, Mich.

Continuation of Ser. No. 412,554, Nov. 5, 1973, abandoned.
This application Nov. 29, 1974, Ser. No. 528,467
Int. Cl.² H04R 9/02
U.S. Cl. 179—115.5 R 3 Claims



1. A magnet assembly for a permanent magnet dynamic transducer having a coil axially reciprocable in a narrow annular gap between a central straight cylindrical pole piece of magnetically conductive material and a surrounding first end plate of magnetically conductive material, the magnetic circuit of said gap being completed by a flat annular permanent magnet surrounding said pole piece in radially spaced relation thereto and being in lapped relation to said first end plate, and a second end plate of magnetically conductive material lapped against the opposite end of said magnet and extending radially inwardly of the interior surface of the magnet into magnetically conductive contact with the opposite end of said pole piece from said gap,

said end plates being characterized by axially exterior ends that taper from thin peripherial edges in lapped relation adjacent to the peripherial edges of the ends of said magnet with the plates increasing in axial thickness in concavely curved surfaces radially inwardly to annular portions of maximum thickness located radially inwardly of the radially inner surface of said annular magnet,

the tapers on said end plates being such as to produce cross sectional areas in each plate taken radially and axially of the tapers which are less than 50 percent of similar cross sectional areas of untapered plates having the same maximum axial and radial dimensions.

3,953,688

CORD REEL AND WRITING PAD ATTACHMENT FOR TELEPHONES

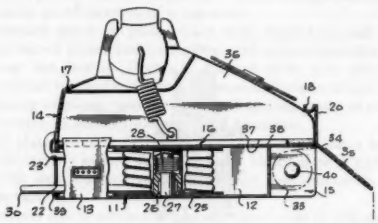
Dominica R. Rocha, 8862 Cadallic Ave., Los Angeles, Calif. 90064

Filed Dec. 9, 1974, Ser. No. 530,510
Int. Cl.² H04M 1/21
U.S. Cl. 179—147 5 Claims

1. A telephone accessory combination for coiling a length of telephone cord and for providing a note paper and writing implement holder comprising:

a housing having an upper edge defining the entrance into an internal cavity;

a reel rotatably carried on said housing within said cavity;
spring means normally biasing said reel to coil said cord therearound;
a writing panel carried on said housing;
a supply of paper rotatably carried on said housing and within said cavity and having a length of paper extending across said writing panel;



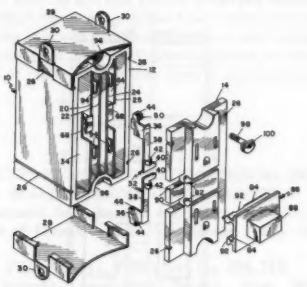
snap-lock fastener means detachably connecting said housing about its upper edge to a conventional telephone housing;
an end piece defining one end of said housing;
slots formed in said end piece for movably passing portions of said telephone cord; and
said fastener means including inwardly projecting elements carried on said end piece and said writing panel opposing each other in resilient relationship so as to snap-lock about the opposite ends of said telephone housing.

3,953,689

CONVERTIBLE SWITCH AND OUTLET ASSEMBLY

Louis Marrero, 13004 Via Del Valedor, Poway, Calif. 92129

Filed Oct. 16, 1974, Ser. No. 515,298
Int. Cl.² H01R *13/70*
U.S. Cl. 200—51 R **6 Claims**



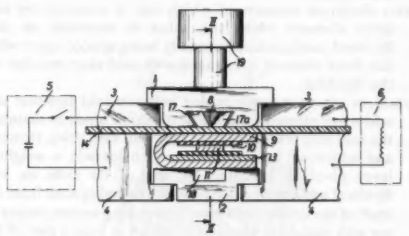
1. A switch assembly comprising:
a wiring box;
a stationary contact mounted in said wiring box and having terminal means for attaching a power wire;
a pair of contacts movably mounted in said wiring box, each having terminal means for connection with a wire and being selectively movable to a position in contact with said stationary contact and to a position spaced from said stationary contact;
each of said movable contacts having a projection mounted thereto, both of which projections extend in substantially the same direction;
said wiring box defining a pair of open-ended parallel channels adjacent respective ones of said projections;
a sliding toggle plate accessible from outside said wiring box and having a pair of parallel ribs mounted thereon, said ribs being engaged in respective ones of said channels;
each of said ribs having a relieved portion and bearing individually on a separate one of said projections, whereby by reciprocating said toggle plate said ribs alternately depress and release said projections such that said movable contacts alternately move between said contacting position and said spaced position;
said ribs being removably engaged in said channels whereby said toggle plate is removable from said wiring box to permit replacement with a different toggle plate or a pair of toggle plates each having a separate rib such that different switch configurations are achieveable with a single wiring box.

3,953,690

HIGH-CURRENT HIGH VOLTAGE SWITCH WITH INCISOR ELECTRODE

Heinrich Korr, Aachen, Germany; Douwe Maas, Hilversum, Netherlands, and Gerhard Telemann, Julich, Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Mar. 13, 1975, Ser. No. 558,070
Claims priority, application Germany, Mar. 14, 1974, 2412261
Int. Cl.² H01H *39/00*
U.S. Cl. 200—61.08 **5 Claims**



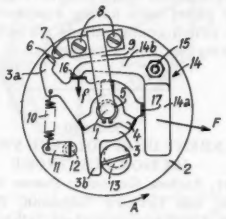
1. In a rapid-action, high-voltage, high-current switch which comprises a switching electrode formed with a longitudinally extending groove having a mouth narrower than its base, a counterelectrode spaced from said switching electrode, a U-section sheet-aluminum body disposed between said electrodes with said first shank in contact with said counterelectrode and a second shank juxtaposed with said switching electrode, an insulating foil interposed between said second shank and said switching electrode, and means between said shanks for explosively driving said second shank into said groove to effect electrical connection between said body and said switching electrode by piercing of said insulating foil, the improvement which comprises a longitudinally extending continuous prismatic bar converging in the direction of said body to an edge adapted to penetrate said foil, said bar being disposed in said groove, said groove extending beyond said body and said bar having a length equal to the width of said second shank along said groove.

3,953,691

INERTIA SWITCH FOR DETECTING IMPENDING LOCKING OF A ROTARY MEMBER, SUCH AS A VEHICLE WHEEL

Albert Grosseau, Chaville, France, assignor to Societe Anonyme: Automobiles Citroen, Paris, France

Filed July 22, 1974, Ser. No. 490,667
Claims priority, application France, July 23, 1973, 73.26921
Int. Cl.² H01H 35/10; B60T 8/00
U.S. Cl. 200—61.46 8 Claims



1. An inertia switch having a variable operating threshold for detecting impending locking of a rotary member, such as a vehicle wheel, comprising:

a shaft connected for rotation by said rotary member;

a flywheel idly mounted on said shaft;

a stop member carried by said flywheel;

a flywheel drive element, mounted on said shaft for rotation therewith, cooperable in the direction of rotation with said stop member to drive said flywheel in said direction of rotation;

two electrical contacts of which one is mounted on said drive element whilst the other is mounted on said flywheel, said contacts normally being spaced apart when the drive element is engaged with said stop member on the flywheel;

resilient return means coupled between said flywheel and said drive element, the effect of which tends to maintain the said stop member in contact with said drive element, and additional return means which include a weighted lever pivotally mounted by one of its ends on said flywheel and about an axis parallel to and spaced from the shaft of the device, said lever comprising means cooperating with said drive element by which at least a part of the centrifugal force to which the lever is subjected in rotation is transmitted to said drive element to increase the force of contact of said drive element on said stop member carried by said flywheel.

3,953,692

PRESSURE RESPONSIVE SWITCH FOR CONVERTING PRESSURE VARIATIONS TO ELECTRICAL VARIATIONS

Matsuo Amano; Seiko Suzuki; Sigeyuki Kobori, all of Hatachi, and Ichiro Kimura, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 9, 1974, Ser. No. 486,744
Claims priority, application Japan, July 13, 1973, 48-78427
Int. Cl.² H01H 35/34
U.S. Cl. 200—83 P 23 Claims

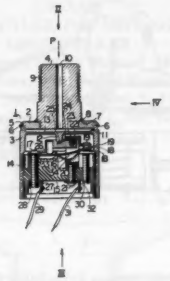
1. In a pressure system of the type including first means for varying pressure of a fluid and second means for activating said first means, a pressure responsive switch means for controlling said second means, the improvement wherein said pressure responsive switch means comprises:

a hollow casing;

a switch body threadedly supported within said hollow casing;

snap spring means including a spring member having a first end secured to said switch body and a second movable end, a movable contact secured to said second movable end, and means for effecting snap action of said spring member such that said movable contact is selectively moved between first and second positions;

an ON contact and an OFF contact disposed respectively at said first and second positions such that said movable contact is selectively moved to be in contact with said ON contact and said OFF contact respectively;



pressure responsive means for transmitting a predetermined applied pressure to a predetermined portion of said spring member to actuate said means for effecting snap action; and

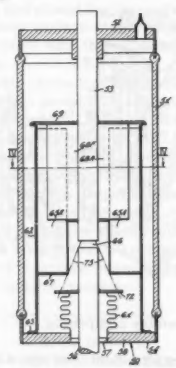
means for adjusting said predetermined applied pressure be variation of the positional relationship between said hollow casing and said switch body threadedly supported therein.

3,953,693

VACUUM SWITCH WITH INTEGRATED CAPACITOR SHIELD

Herbert M. Pflanz, Westwood, Mass., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 9, 1974, Ser. No. 504,335
Int. Cl.² H01H 33/66
U.S. Cl. 200—144 B 3 Claims



1. In a vacuum switch having an integral capacitor;

an insulating cylindrical envelope having its opposite ends hermetically sealed by metallic end caps;

a stationary contact rod extending through the first of said metallic end caps into said envelope, said stationary contact rod being supported by said end cap in vacuum sealed relationship;

a movable contact rod extending through the second of said metallic end caps, said movable contact rod being opera-

bly supported by the second of said end caps in vacuum sealed relationship for axial movement into and out of electrical engagement with said stationary contact rod;

a bellows secured in vacuum tight relationship around said movable contact rod and to said second metallic end cap to provide for limited axial movement of said movable contact rod and ensuring the integrity of the envelope;

a first group of plates carried by said stationary contact rod, each plate of said first group of plates being operable to serve as an element of a capacitor;

a second group of plates fixed with respect to said first group of plates and carried by said second metallic end cap but not in electrical contact with said movable contact rod and extending between said plates of said first group of plates, said plates of said second group of plates serving as another element of a capacitor,

said plates of said first and second group of plates being electrically interrelated to provide impedance in parallel with said contact rods for voltage distribution in the switch;

a tubular shield surrounding said contact rods in concentric relationship, said tubular shield being secured to said second end closure;

a circular lower deflector plate having an axial opening disposed in said tubular shield and around said movable contact in concentric relationship, said circular lower deflector plate being disposed in abutting and secured engagement with the lower ends of the plates of said second group of plates;

a bellows plate mounted about and secured in vacuum tight relationship to said movable contact rod said bellows plate being disposed adjacent to the inner end of said bellows and being of a diameter which is greater than the diameter of said bellows to thereby serve as an umbrella to deflect arc particles from striking said bellows, said bellows plate diameter being sufficient so that a line-of-sight path, which is tangent to the contact edge of said movable contact rod when in open position and also tangent to the lower inner edge of said plates of said second group of plates, intersects the surface of said bellows plate inwardly of the edge thereof;

said circular lower deflector plates serving to accumulate arc particles to prevent a buildup of arc particles on the second end cap and said tubular shield prevents arc particles which escape the circular lower deflection plate from reaching said insulating envelope and said circular lower deflector plate also reinforces the plates of said second group of plates to maintain them in operative position.

3,953,694
MAGNETIC-BLAST ARC EXTINGUISHING DEVICE HAVING PERMANENT MAGNETS

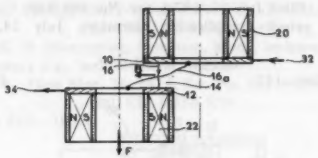
Georges Bernard, Saint-Egreve, and Pierre Montanier, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Aug. 12, 1974, Ser. No. 496,710
Claims priority, application France, Aug. 30, 1973, 73.31481
Int. Cl.² H01H *33/18, 9/44*
U.S. Cl. 200—147 A **4 Claims**

1. An arc extinguishing device comprising:

a pair of electrode means separable to draw an arc therebetween and having current-transfer branches engaging each other in the closed position of said electrode means to define a generally X-shaped contact zone, said branches forming in the open position of said electrode means two pairs of diverging arcing contacts for the roots of said arc; and

a pair of permanent magnet means disposed on either side, respectively, of the interval separating said electrode means in the separated position thereof to produce in said interval additive magnetic fields directed substantially transversely of the initial direction of said arc to magnetically blast said arc causing said roots to travel rapidly

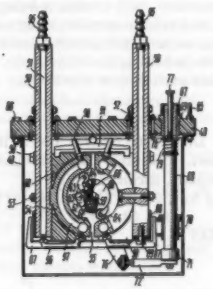


along one of said pairs of diverging arcing contacts thereby lengthening said arc.

3,953,695
HEAVY CURRENT SWITCH

Osip Borisovich Bron, Michurinskaya ulitsa 1, kv. 35; Valentin Danilovich Molchanov, Piskarvesky prospekt, 19, kv. 66, both of Leningrad; Lev Notovich Shifrin, ulitsa Zelenodolskaya 17, korpus 3, kv. 31, Moscow, and Adolf Rudolfovich Freivald, prospekt Veteranov 25, kv. 62, Leningrad, all of U.S.S.R.

Filed July 26, 1973, Ser. No. 383,304
Int. Cl.² H01H *33/68, 9/52*
U.S. Cl. 200—150 C **2 Claims**



1. A heavy current switch comprising two stationary contact systems made in the form of half-cylinders facing each other and having water-cooling channels, said systems forming two inter-contact gaps; a base supporting said contact systems; a shaft coupled with said base; a movable contact system secured on said shaft in the cylindrical space defined by said stationary contact systems and carrying two groups of insulated contact rollers arranged at the opposite sides of said movable contact system and closing or breaking the inter-contact gaps between the stationary contact systems.

2. A heavy current switch as claimed in claim 1, wherein the space between the stationary contact systems and the movable contact system is filled with oil.

3,953,696

ACTUATOR CONSTRUCTION HAVING RELEASABLE LOCK IN ACTUATED AND DEACTUATED POSITIONS

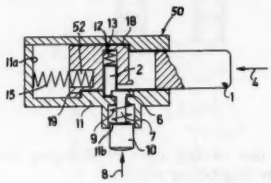
Christian Reimann, Rottweil; Hugo Weber, Gosheim, and Ewald Ueth, Rietheim, all of Germany, assignors to J. & J. Marquardt, Germany

Filed July 12, 1974, Ser. No. 488,049

Claims priority, application Germany, July 14, 1973, 2335972

Int. Cl.² H01H 9/06

U.S. Cl. 200—157 4 Claims



1. An actuator, comprising a housing having a housing bore with an opening, said housing having a stop surface along the bore, a push button actuator in the bore projecting through the opening and having a cavity, a lock bolt movable in the cavity and engaged in the deactivated position against said stop surface, lock bolt biasing means biasing said lock bolt into engagement with said stop surface, said housing having a recess, a release member movable in the housing recess and engageable with the locking bolt, said release member having a release button which projects out of the housing, said locking bolt being displaceable against said lock bolt biasing means out of engagement with the stop surface by said release member, said push button being displaceable along the housing bore to move to an actuated position when said locking bolt is disengaged from the stop surface, said actuator button including an extension, said extension being in a position in which it passes said release member when said actuating button is moved to an activated position, said release member being engageable behind said extension to block the return movement of said push button actuator.

3,953,697

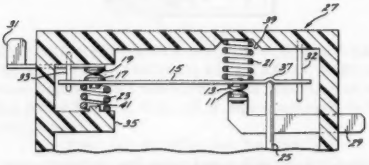
DUAL FULCRUM SWITCH

Allen L. Teichert, Placentia, Calif., assignor to Robershaw Controls Company, Richmond, Va.

Filed Nov. 28, 1973, Ser. No. 419,806

Int. Cl. H01h 1/20

U.S. Cl. 200—243 6 Claims



1. Dual fulcrum switch apparatus comprising:

a housing;

first and second fulcrum contacts mounted from said housing in substantially opposed relationship and spaced apart transversely out of alignment with one another;

an elongated electrically conductive lever blade interposed between said fulcrum contacts and including third and fourth contacts on the opposite extremities thereof and disposed on the opposite sides of said blade for engagement with said respective first and second fulcrum contacts;

biasing means engaged with said blade and urging said third and fourth contacts in opposite directions into engagement with said respective first and second fulcrum contacts; and

a switch actuator engaging said lever blade and operable upon actuation thereof to rotate said blade in one direction about said second fulcrum contact to break said first fulcrum and third contacts and further operable when said first fulcrum and third contacts are welded together to rotate said lever arm in said one direction about said third fulcrum contact to break said second fulcrum and fourth contacts.

3,953,698

CONTACT SYSTEM FOR A VACUUM SWITCH

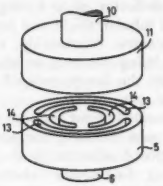
Hans Luttgert, Berlin, and Werner Kohler, Bentfeld, Holstein, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 26, 1974, Ser. No. 509,725

Claims priority, application Germany, Sept. 28, 1973, 2349569

Int. Cl.² H01H 1/06

U.S. Cl. 200—279 5 Claims



1. A contact system for a vacuum switch comprising contact members movable relative to each other for electrically opening and closing the vacuum switch, each of the contact members including a carrier and a contact piece mounted on said carrier, and opening means formed in at least one of the contact pieces for guiding the arc drawn when the contact pieces are separated from each other, said opening means being a plurality of arc-like openings formed in said one contact piece, said arc-like openings being grouped into at least two sets, the first set of arc-like openings being arranged in a row along a first circular arc so that each two mutually adjacent ones of said arc-like openings conjointly define a space therebetween, and the second set of arc-like openings being arranged in a row along a second circular arc substantially concentric to said first circular arc, said second set of arc-like openings being arranged so that each two mutually adjacent ones of the same conjointly define a space therebetween, said arc-like openings of said first and second sets being situated along said circular arcs so as to cause each one of said arc-like openings to be adjacent and extend beyond a corresponding one of said spaces in the adjacent circular arc.

3,953,699

FASTENING ARRANGEMENT FOR THE SWITCHING MECHANISM CAGE OF AN ELECTRIC SWITCHING APPARATUS

Karl-Heinz Scheibel; Nikolaus Miheilowitsch, and Heinz Goerndt, all of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 12, 1974, Ser. No. 505,385

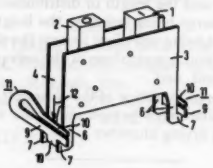
Claims priority, application Germany, Sept. 13, 1973, 2346210

Int. Cl.² H02B 1/03

U.S. Cl. 200—295 8 Claims

1. In an electric switch comprising a base fabricated of electrical insulation material and a switching mechanism cage including at least two side plates fastened to said base, the improvement comprising outwardly extending projection

members, disposed at opposite ends of at least one edge of each of said side plates, and each including a hook portion at the end thereof extending outwardly from the lateral edges of said plates, said base including recesses extending there-



through receiving said projection members and said hook portions projecting from said base, and further comprising spring means, disposed between said base and said hook portions of said projection members, fastening said plates to said base.

3,953,700

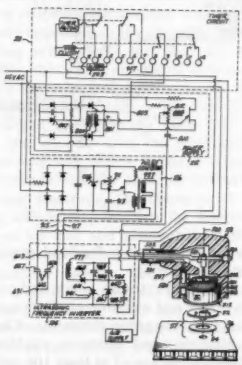
INDUCTION HEATER APPARATUS AND SYSTEM

Melvin R. Sindt, Stanwood, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 331,724, Feb. 12, 1973, Pat. No. 3,845,268. This application Mar. 4, 1974, Ser. No. 448,111

Int. Cl.² H05B *5/08*

U.S. Cl. 219—10.79 **1 Claim**



1. A primary coupling coil having a high transformer ratio with respect to the conductor secondary for providing high peak currents in the conductor displaced a predetermined distance from the primary and embedded in a hot melt type structure in which the primary coil is disposed within a housing, said coil having first and second major faces and said coil comprising a plurality of turns of an insulated conductor having a rectangular cross-sectional area wound about a central axis having interleaved between selected turns after the first complete turn a plurality of spaced apart metallic heat conducting fins extending from a first of the two major faces of said primary coil into an air chamber within said housing, the second of said two major faces of said primary coil faced with a sheet of insulating material having electrical insulating quality, said housing including said air chamber and an air communicating channel having coupled thereto a source of air pressure for causing an air flow to be directed through said air communicating channel and against said plurality of spaced apart metallic heat conducting fins extending into said air chamber, and wherein said plurality of spaced apart metallic heat conducting fins are arranged concentrically about the central axis of the air flow path.

3,953,701

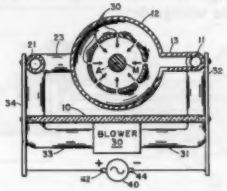
RADIO FREQUENCY HEATING AND VENTILATING ELECTRODE SYSTEM

Joshua G. D. Manwaring, Needham, Mass., assignor to Radio Frequency Co., Inc., Medfield, Mass.

Filed Mar. 24, 1975, Ser. No. 561,498

Int. Cl.² H05B *9/04*

U.S. Cl. 219—10.81 **4 Claims**



1. A radio frequency heating and ventilating electrode system for use with a radio frequency generator having outputs of different polarity for treating an extended length of rod-like electrically non-conducting material, comprising

a plurality of electrically conductive hollow loop electrode elements each having a plurality of inwardly directed apertures therethrough, said loop elements being generally coaxial with and parallel to one another and spaced from one another in superposed relationship in a direction perpendicular to the plane of said loop electrode elements along a common axis

said loop electrode elements forming two series of loop electrode elements arranged alternately with one another along said common axis

loop electrode element mounting means for each of said two series of loop electrode elements, including hollow, electrically conductive support members electrically connected to each of said loop electrode elements providing fluid communication thereinto, and

fluid supply means connected to said support members for providing fluid flow thereto,

said conductive support members being connected to different polarity outputs of said radio freqency generator to provide said different polarity outputs on said two series of ring electrode elements

for heating and ventilating rod-like, electrically non-conducting material positioned along said common axis within said loop electrode elements.

3,953,702

SOLID STATE MICROWAVE OVEN POWER SOURCE

Samuel H. Bickel, Garland, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 13, 1974, Ser. No. 497,152

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 R **6 Claims**

1. A solid state microwave power source comprising:

a. a microwave power producing means;

b. an equal phase microwave power divider coupled to the microwave power producing means for dividing equally the microwave power and matching the impedance of the microwave power producing means to the impedances of a plurality of solid state microwave amplifiers, said equal phase microwave power divider having a plurality of output ports;

c. a plurality of solid state microwave amplifiers coupled to the output ports of the equal phase microwave power divider for amplifying the microwave power; and

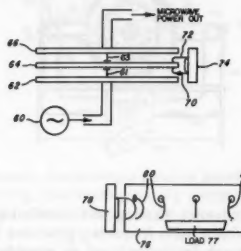
d. an equal phase power combiner connected to the plurality of solid state microwave amplifiers for combining the amplified microwave power output into a source of amplified microwave power, whereby a low microwave power source may be amplified into a substantially higher microwave power source.

3. A solid state microwave power source comprising:

a. a source of microwave energy;

b. a pair of spaced disc shaped conductor plates forming a first disc shaped waveguide;

c. an antenna centrally disposed within the first disc shaped waveguide, said antenna coupled to the source of microwave energy for transmitting the microwave energy through the waveguide;



d. a first plurality of antennas positioned adjacent the circumference of the first disc shaped waveguide for receiving microwave energy arriving with equal phase at the circumference of the first disc shaped waveguide;

e. a plurality of solid state microwave power amplifiers coupled to the first plurality of antennas for amplifying the microwave energy;

f. a third disc shaped conductor coacting with one of the pair of spaced disc shaped conductors to form a second disc shaped waveguide; and

g. a second plurality of antennas coupled to the plurality of solid state amplifiers, said second plurality of antennas positioned in the second disc shaped waveguide adjacent its circumference for transmitting the amplified microwave power energy to the center of the second disc shaped waveguide.

3,953,703

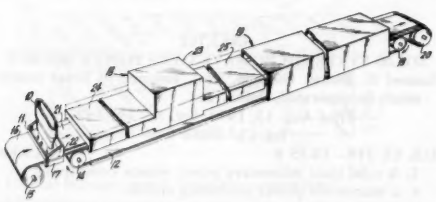
METHOD FOR DRYING CERAMIC TAPE

Steven Hurwitt, Park Ridge, N.J., assignor to Materials Research Corporation, Orangeburg, N.Y.

Filed Oct. 3, 1974, Ser. No. 511,673

Int. Cl.² H05B 9/06

U.S. Cl. 219—10.55 M **3 Claims**



1. In a process for manufacturing ceramic products of the type that includes mixing finely ground ceramic material with a volatile solvent and a binder to form a slip, distributing the slip in a layer onto a continuously moving surface, conveying the ceramic layer on the moving surface through a drying chamber, circulating a flow of heated air through the drying chamber for evaporating the solvent to produce a dry ceramic tape, the improved method of drying the slip layer comprising the sequential steps of:

subjecting the layer of slip to ultra high frequency electromagnetic energy substantially evenly distributed along the length of the moving tape in a region adjacent to the entrance of the drying chamber, the intensity of the electromagnetic energy being on the order of 1 watt per square inch and the length of distribution of the electromagnetic energy being less than the length of the drying chamber but being sufficient to heat the slip uniformly to the evaporation temperature of the solvent without boiling the solvent, and

completing the evaporation of the solvent from the slip only by the circulation of heated air as the slip is conveyed through the drying chamber.

3,953,704

COATING APPARATUS

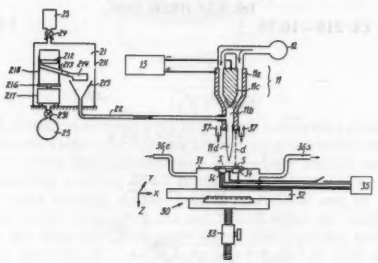
Jean Bejat, 4, rue Antoine Petit, 92260 Fontenay-aux-Roses, France; Michel Braguier, 11, rue de la Planche, 75007 Paris; Roger Tueta, 40, rue Cavendish, 75019 Paris; Raoul Vistosi, 54, rue de Meaux, 93140 Bondy; Maurice Verna, 14, rue du Docteur le Thiere, 27000 Evreux; Gerard F. Aubin, 8, rue Corneille, 27000 Evreux, and Christian Naturel, 9, rue Pierre de Coubertin, 27000 Evreux, all of France

Filed Apr. 5, 1974, Ser. No. 458,126

Claims priority, application France, Apr. 5, 1973, 73.12323

Int. Cl.² C23B 13/12

U.S. Cl. 219—76 **2 Claims**



1. Apparatus for depositing a fluidized metal layer on a ceramic substrate, comprising:

a plasma torch having a cathode, anode and an arc therebetween at its outlet and a source of plasmagenic gas at its inlet selected from the group consisting of helium, argon, hydrogen, nitrogen, and mixtures enabling an outlet speed of plasmagenic gas of at least 100 m/s;

a source of powdered metal;

an adjustable delivery distributor fed from a plasmagenic gas source enabling a fine metallic powder from said powder metal source containing hardly any agglomerates to be injected into the plasmagenic gas by said plasmagenic gas acting as a fluidizing carried gas;

said distributor fitted with a sieve, spout, vibrating means, and delivery duct;

an adjustable substrate holder means, whose distance from the anode at the outlet of the torch is adjustable;

means to move the substrate holder means in a first direction;

means to move the substrate holder means in a second direction transverse to the first direction;

mounting means for the substrate holder means;

the substrate holder means being mounted for movement in said two mutually transverse directions to that the substrate is swept by the plasma flame of the torch;

resistance heating means in thermal contact with said substrate holding means for controlling the temperature of the substrate;

means adjacent the anode of said plasma torch for blowing air onto the substrate; and,

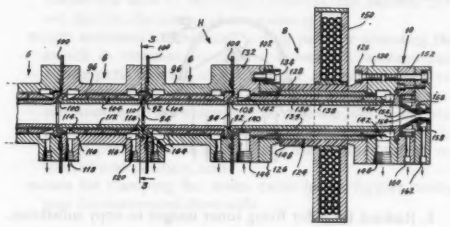
circulating liquid cooling means in said substrate holder means for cooling the substrate.

3,953,705

CONTROLLED ARC GAS HEATER

James H. Painter, Winfield, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Sept. 3, 1974, Ser. No. 502,620
Int. Cl.² B23K 5/00
U.S. Cl. 219—121 P 9 Claims



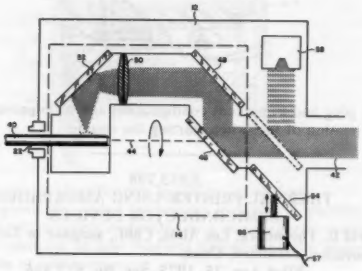
1. An arc gas heater comprising: an injector unit having an enlarged chamber of circular cross section therein and means for injecting primary gas into the chamber at the periphery thereof; a tubular rear electrode attached to the injector unit and projecting rearwardly therefrom with the hollow interior of the electrode opening into the chamber, the diameter of the electrode being substantially less than the diameter of the chamber; a dielectric element located between the rear electrode and the injector unit to electrically isolate the rear electrode for the injector unit; a plurality of interelectrode segments arranged one after the other and projecting forwardly from the injector unit, the interelectrode segments having hollow interiors which define a constrictor passage which communicate with the chamber and axially aligns with the tubular rear electrode, the diameter of the constrictor passage being substantially less than the diameter of the chamber in the injector unit and also substantially less than the length of each interelectrode segment, the diameter of the constrictor passage further being substantially constant throughout its length so that gas will flow through the constrictor passage at a relatively high and substantially constant pressure; a front electrode attached to the forwardmost interelectrode segment and having a hollow interior which aligns with the constrictor passage, the hollow interior of the front electrode being substantially the same diameter as the constrictor passage so as to form a continuation of the constrictor passage; a nozzle located at the forward end of the tubular front electrode and having a throat which is axially aligned with the constrictor passage, the throat having a diameter which is substantially less than that of the constrictor passage so that the gas may accelerate to the sonic velocity within the throat; dielectric discs located between adjacent interelectrode segments and between the rearmost segment and the injector unit and the forwardmost segment and the front electrode so that the interelectrode segments are electrically isolated from one another as well as from the injector unit and the front electrode, means for introducing secondary gas into the constrictor passage from the periphery thereof generally in the regions where adjacent interelectrode segments are contiguous, whereby a potential placed across the two electrodes will cause an arc to extend through the constrictor passage with the termini of the arc being at the electrodes and the arc will transfer energy to the high pressure gas in the constrictor passage, imparting high enthalpy to that gas before it is accelerated to the sonic velocity in the throat.

3,953,706

LASER BENT BEAM CONTROLLED DWELL WIRE STRIPPER

Charles W. Harris; Allen C. Layton, and Robert E. Howle, all of Orlando, Fla., assignors to Martin Marietta Corporation, Orlando, Fla.

Continuation of Ser. No. 456,418, March 29, 1974, abandoned. This application Dec. 4, 1974, Ser. No. 529,553
Int. Cl.² B73K 27/00
U.S. Cl. 219—121 L 22 Claims



1. A device for enabling the selective stripping of a portion of the insulation from an electrical lead on a rapid basis without damage to the conductor portion of the lead, comprising a rotatable optical unit having an aperture at each end, a first of said apertures being configured to receive a variety of sizes and types of electrical leads whose ends are to be stripped of insulation for a selected length, and the second of said apertures being arranged to receive output energy from an adjacently located laser operating at a wavelength and power level such as will cause the ablation of insulation, each of said apertures being disposed essentially on the axis of rotation of said optical unit, and optical components disposed in said optical unit at locations between said apertures for appropriately re-directing the laser energy entering through said second aperture, said optical components being responsible for directing and focusing a laser beam upon a nonrotating lead inserted through said first aperture, such laser beam, because of the rotation of said optical unit, providing a circumferential cut in the insulation of the electrical lead at a location selected by the user, thus to enable the removal of such selected portion of the insulation from the conductor of the lead.

3,953,707

METHOD FOR PREHEATING AIRCOOLED, AIRCRAFT ENGINES

Peter G. Tanis, 1226 Highway 169 S., Fort Dodge, Iowa 50501

Filed Sept. 14, 1973, Ser. No. 397,372
Int. Cl.² H05B 1/00; F02N 17/02; F01M 5/02
U.S. Cl. 219—205 5 Claims

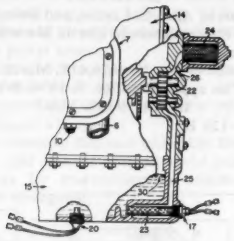
1. The method of preheating an aircooled, aircraft engine prior to starting the engine, said engine having

a cylinder head casting, a spark plug in the casting of the cylinder head and a blind hole formed entirely in the metal of said casting immediately adjacent the spark plug, which comprises

inserting in said blind hole an electric heating device of construction, size and shape such that the device is substantially entirely confined in the metal wall of the casting,

applying an electric current to said heating device to generate heat therein whereby substantially all the heat is transferred to the casting to heat the casting immediately adjacent the spark plug, and

maintaining the current for sufficient time to generate enough heat in the casting to prevent frosting of the spark



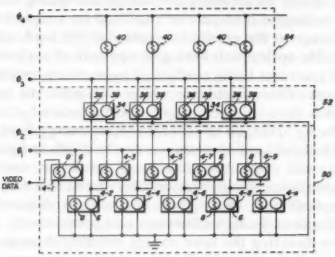
plug and to prevent condensation and to improve vaporization of fuel when starting the engine.

3,953,708

THERMAL PRINTER USING AMORPHOUS SEMICONDUCTOR DEVICES

David D. Thornburg, Los Altos, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 25, 1975, Ser. No. 572,486
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **9 Claims**



1. A thermal printer for marking a heat-sensitive material comprising:

a shift register having a plurality of stages,

a line buffer having a plurality of stages,

a plurality of heat generating print heads in heat transfer relationship with the heat-sensitive material,

each of said stages of both said shift register and said line buffer being comprised of a heat responsive amorphous semiconductor threshold switch and an adjacent heating element, said threshold switches each being comprised of a body of amorphous semiconductor material with opposed surfaces of said body of amorphous semiconductor material bounded by first and second electrodes with said body extending slightly beyond one of said electrodes such that each of said threshold switches has a voltage-current characteristic with a generally high resistance region to a threshold voltage and an abrupt transition to a low resistance region with said threshold voltage decreasing as the ambient temperature of said threshold switch increases,

first means for coupling said stages of said shift register together, for coupling each of said stages of said line buffer to a different stage of said shift register, and for coupling each of said print heads to a different one of said stages of said line buffer, and

second means for supply phased waveforms to said shift register, said line buffer and said print heads such that a video bit string supplied to the first stage of said shift register can be stored in said shift register, then transferred in parallel to said line buffer, and then transferred in parallel to said print heads to heat selected print heads in accordance with said video bit string to thereby cause marking of said heat-sensitive material in accordance with said video bit string.

3,953,709

TWO SOURCE RADIANT FUSER FOR XEROGRAPHIC REPRODUCING APPARATUS

John F. Elter, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 25, 1974, Ser. No. 446,039
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **6 Claims**

1. Radiant fuser for fixing toner images to copy substrates, said fuser comprising:

a first radiant source of energy for fushing high density images without scorching said copy substrates; and

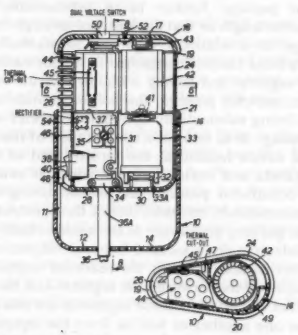
a second source of radiant energy for fusing low density images without fusing background toner particles, said second source of radiant energy comprising a low mass member capable of rapid temperature increases and operating at a temperature of about 800°C.

3,953,710

COMPACT PORTABLE HAIR DRYER

Hugh Edric Trendhard Dyer, Wimborne, England, assignor to Firth Cleveland Limited, London, England

Filed July 10, 1974, Ser. No. 487,136
Claims priority, application United Kingdom, July 17, 1973, 33946/73
Int. Cl.² H05B *1/00*; A45D *20/12*; F04B *35/04*
U.S. Cl. 219—370 **3 Claims**



1. A hair dryer comprising

a main casing part,

a further casing part telescopically, rectilinearly slidable between a retracted end position and an extended end position in said main casing part, and having an ambient air inlet opening grid structure, and an outlet opening grid structure, the air inlet and outlet grid structures of the further casing part being fully covered by the main casing

part in the retracted end position, and fully exposed in the extended end position,

a fan mounted in the further casing part arranged to draw in air through the said inlet opening grid structure and discharge air through the outlet opening grid structure,

an electric heater element mounted in the further casing part between the fan and the outlet opening grid structure,

a thermal cut-out device in said further casing part between the fan and the outlet opening grid structure, and connected in circuit with the heater element,

an electric motor mounted within the further casing part,

a coupling operatively connecting the motor and the fan for rotation of the fan,

a switch mounted in the further casing part and electrically-connected both to the heater element, the thermal cut-out device, the motor and a mains cable,

means mounted on the main casing part for actuating the switch in response to relative movement between said casing parts to energize the electric motor and the electric heater element as the casing parts are slid relative to one another to the extended end position and to de-energize the electric motor and electric heater element as the casing parts are slid relative to one another to the retracted end position, and

means for clamping the mains cable in the further casing part for movement therewith.

3,953,711
COOKING UNITS

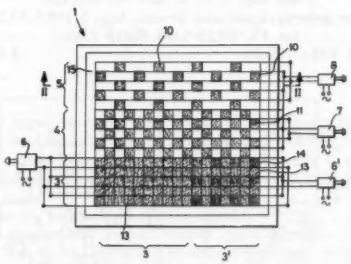
Walter Eck, Munich, and Walter Heywang, Neukeferloh, Munich, both of Germany, assignors to E.G.O. Elektro-Geraete Blanc und Fischer, Oberderdingen, Germany

Filed Nov. 4, 1974, Ser. No. 520,959

Claims priority, application Germany, Nov. 6, 1973, 2355412

Int. Cl.² H05B *3/68*

U.S. Cl. 219—464 **8 Claims**



1. An electrical cooking unit for a stove comprising a substantially flat and heat transmissive cover on which cooking can take place; heating resistors in the form of PTC resistor elements being distributed over and mounted on the underside of the cover to provide a plurality of cooking zones of different energy density; and electrical circuit means, connected to the PTC resistor elements, for applying a voltage thereto; the PTC resistor elements being made of a material having a resistance which increases as a step function with increasing temperature, the step increases occurring at a particular temperature called the step temperature.

3,953,712
MAGNETIC IDENTIFICATION APPARATUS

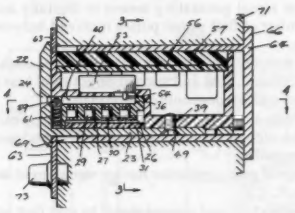
Stephen Horvath, St. Ives, Australia, assignor to Engineering Design & Development Pty. Ltd., Sydney, Australia

Filed Apr. 26, 1974, Ser. No. 464,412

Claims priority, application Australia, Nov. 9, 1973, 53225/73

Int. Cl.² G06K *7/08*; G11B *15/42*

U.S. Cl. 235—61.11 D **19 Claims**



4. Magnetic identification apparatus comprising:

a magnetically coded instrument including a plurality of discrete magnets embedded in a non-magnetic material, the position of said magnets determining the magnetic code of said instrument; and

a reader to which to apply said magnetically coded instrument comprising:

a body defining a guideway for said instrument, and

a plurality of sensor means, for sensing said discrete magnets, mounted on said body adjacent said guideway in such a position that each of said sensor means may register with an associated one of said plurality of discrete magnets when said magnetically coded instrument is applied to said reader, each of said plurality of sensor means comprising a helically wound sensor coil positioned transverse to said guideway, said sensor coils providing an output signal when one of said discrete magnets is moved past said sensor coil.

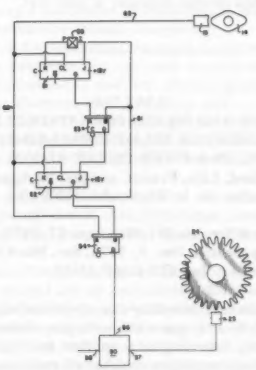
3,953,713
REEL DIAMETER DISCRIMINATOR

John De Ligt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,496

Int. Cl.² H03K *21/36*

U.S. Cl. 235—92 DN **9 Claims**



1. A reeled material diameter monitoring apparatus comprising:

An axis for rotatively supporting a reel of flexible material;

Means to rotate said reel about said axis;

Means to generate a first electrical pulse signal, each pulse being responsive to the passage of a predetermined number of arcuate degrees of said reel rotatively passing a reference point;

Means to generate a second electrical pulse signal, each pulse being responsive to the passage of a predetermined linear magnitude of said reeled material past a reference point;

Counting means having count reset means connected to said first signal generating means to digitally accumulate the number of first signal pulses received between a reset interim;

First and second flip-flop signal conductors, each having a clock terminal, first and second directional bias terminals and first and second output terminals;

First and second AND signal gate conductors, each having first and second bias terminals and first and second output terminals;

A NOT signal gate conductor having signal input and output terminals;

Means to conduct said second signal to said first and second clock terminals and the first bias control of said first AND gate conductor;

Means to connect said first directional bias terminal of said first flip-flop conductor to the output terminal of said NOT gate conductor;

Means to connect said first directional bias terminal of said second flip-flop conductor to the first output terminal of said second AND gate conductor;

Means to connect said second directional bias terminal of said first flip-flop conductor to the first bias terminal of said second AND gate conductor, to the first output terminal of said second flip-flop conductor, and to the input terminal of said NOT gate conductor;

Means to connect the second output terminal of said first flip-flop conductor to the second bias terminal of said second AND gate conductor;

Means to connect said second bias terminal of said second flip-flop conductor to the second output terminal of said second AND gate conductor;

Means to connect said second output terminal of said second flip-flop conductor to the second bias terminal of said first AND gate conductor;

Means to connect said second output terminal of said first AND gate conductor to a reset terminal of said first signal counting means; and

Means to emit an electrical signal upon the accumulation of a predetermined magnitude of said first pulses, said predetermined magnitude of first pulses being proportional to a predetermined diameter of said reel.

3,953,714
METHOD OF AND MEANS FOR CONTROLLING THE MOVEMENT OF SELF-PROPELLED BODIES TRAVELING IN A FIXED ORDER ALONG A TRACK

Robert Gabillard, Lille, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Courbevoie, France

Continuation of Ser. No. 291,406, Sept. 22, 1972, abandoned. This application Dec. 5, 1974, Ser. No. 529,941
Int. Cl.² G06F *15/48*
U.S. Cl. 235—150.2 **26 Claims**

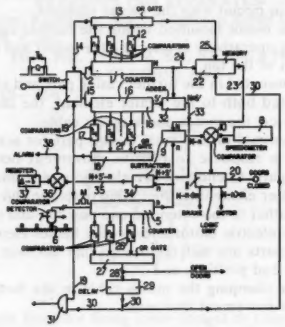
1. In a system for controlling the movement of a plurality of self-propelled bodies, provided with propulsion means and braking means, following one another in a predetermined order on a track serving a number of stations, said system including a fixed post for the periodic emission of a timing signal and markings spacedly disposed at fixed reference points along said track, the improvement wherein each of said bodies comprises:

receiving means for detecting said timing signal and converting same into a series of isochronous pulses;

first counting means connected to said receiving means for registering a count N of said isochronous pulses;

sensing means responsive to said markings for generating a marker pulse upon movement of the body past any of said referencepoints;

second counting means connected to said sensing means for registering a count n of said marker pulses;



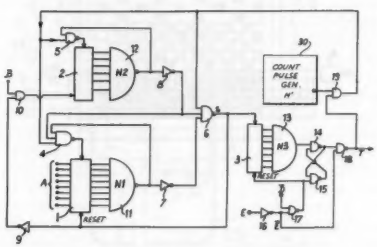
calculating means connected to said first and second counting means for determining the difference N—n of the counts thereof; and

decision means connected to said calculating means for actuating said propulsion means upon said difference N—n at least equaling a certain reference value and for actuating said brake means upon said difference N—n falling short of said reference value.

3,953,715
CONTROL APPARATUS AND PROCESS FOR COMBUSTION ENGINES

Louis Monpetit, L'Etang-la-Ville, France, assignor to Societe des Procedes Modernes d'Injection Sopromi, Clichy, France

Filed Aug. 1, 1974, Ser. No. 493,921
Claims priority, application France, Aug. 3, 1973, 73.28442
Int. Cl.² F02D *5/00*; G05B *15/02*
U.S. Cl. 235—150.21 **5 Claims**



1. Apparatus for producing a regulating function signal of a given duration for controlling the fuel supply system of a combustion engine in response to a coded word defining the duration of said signal comprising:

means for producing counting signals,

first counter means receiving said counting signals and having a predetermined count set therein by said coded word, said first counter means defining a first predetermined period when said predetermined count is reached,

second counter means for receiving a predetermined number of said counting signals to produce a second predetermined period,

third counter means, and first means responsive to the sum of said first and said second predetermined periods as determined by said first and second counter means for providing a said counting signal to said third counter means upon each termination of said first and second predetermined periods established by said first and second counter means, said third counter means counting a predetermined number of said counting signals representative of a predetermined number of said first and second periods to establish said given duration for said control signal.

3,953,716

CONTROL APPARATUS AND PROCESS FOR COMBUSTION ENGINES

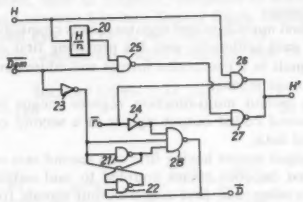
Louis Monpetit, L'Etang-la-Ville, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Aug. 27, 1974, Ser. No. 500,907

Claims priority, application France, Aug. 28, 1973, 73.31027

Int. Cl.² F02D *5/00, 37/02;* **G05B** *15/02*

U.S. Cl. 235—150.21 **7 Claims**



1. In apparatus of the type for producing a regulating function control signal of a given duration for controlling the fuel supply system of a combustion engine in response to a coded word defining the duration of said signal in which the apparatus includes:

means for producing counting signals,

first presettable counter means receiving said counting signals and having a first predetermined count set therein by said coded word, said first counter means defining a first predetermined period when said predetermined count is reached,

second counter means, first means for providing a said counting signal to said second counter means upon each termination of said first predetermined period established by said first counter means counting said first predetermined count, said second counter means counting a second predetermined number of said counting signals representative of a predetermined number of said first periods, and means responsive to the counting signals counted by said second counter means for producing said given duration for said regulating function control signal,

the improvement comprising means responsive to an operating parameter of the engine whose fuel supply is being controlled for controlling the frequency of production of said counting signals.

3,953,717

TEST AND DIAGNOSIS DEVICE

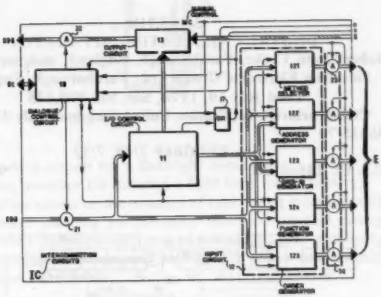
Marcel René Rottier, Rosny, Bois, and Jacques Michel Jean Bienvenu, Paris, both of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Aug. 30, 1974, Ser. No. 502,118

Claims priority, application France, Sept. 10, 1973, 73.32504

Int. Cl.² G06F *11/00*

U.S. Cl. 235—153 AK **10 Claims**



1. In a test and diagnosis device for a first data processing unit including a plurality of operative elements, said device comprising:

first means external to the first unit for manual control and display of data usable for testing and diagnosing manually the first unit in the event of trouble;

a second data processing unit;

a first channel group for bidirectional transmission of control signals for exchange of information between said data processing units;

a second channel group for transmission of information from said second unit;

a third channel group for transmission of information from said first unit to said second unit; and

a plurality of interconnection circuits contained in the first unit and connected to said operative elements thereof;

maintenance circuits comprised in said interconnection circuits and operative for connecting said first unit to said second unit for transmitting signals from one unit to the other under the control of said second unit, said signals comprising a succession of input-output microdialogues, said maintenance circuits comprising:

a first circuit for controlling the input-output microdialogue between said first unit and said second unit, said first circuit connected to said first channel group and to said operative elements within said first unit,

a second circuit for controlling the input-output microdialogues between said units, said second circuit validated by said first circuit and connected to said second channel group,

a third circuit validated by said first circuit and controlled by said second circuit, said third circuit connected to said second channel group and to said operative elements of said first unit,

a fourth circuit validated by said first circuit and controlled by said second circuit and connected to said operative elements of said first unit and to said third channel group

said first circuit responsive to a signal of abnormal operational condition sent by at leat one element of said first unit to said first circuit for enabling an exchange of signals between said second unit and said first circuit through said first channel group for validating input microdialogues and output microdialogues, each of said input microdialogues comprising

transmission of signals through said second channel group to said second circuit followed by a transmission of signals through said second channel group to said third circuit under the control of said second circuit,

each of said output microdialogues comprising a transmission of signals through said second channel group to said second circuit followed by a transmission of signals through said third channel group by said fourth circuit under the control of said second circuits, whereby said first unit may be tested and diagnosed automatically.

3,953,718
DIGITAL CALCULATING APPARATUS

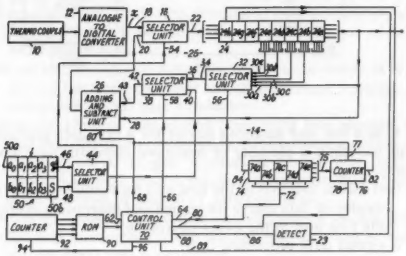
Robert John Cooke, Farnborough, England, assignor to The Solartron Electronic Group Ltd., Farnborough, England

Filed July 19, 1974, Ser. No. 490,175

Claims priority, application United Kingdom, July 31, 1973, 36325/73

Int. Cl.² G06F 7/48, 7/52

U.S. Cl. 235—156 **9 Claims**



1. Digital calculating apparatus comprising:

a store;

means for entering a first number in the store;

a combining circuit connected between an input and an output of the store to form a recirculation loop therewith, the combining circuit including means for carrying out a combining operation on the first number in the store when the number is recirculated through the combining circuit, with successive combining operations serving to change the value of the first number in the store in a predetermined progression selected from the group comprising linear progression and exponential progression as said number is successively recirculated through the combining circuit;

control means for successively recirculating the first number in the store through the combining circuit for a plurality of successive groups of N combining operations, where N is an integer greater than 0, to cause the first number in the store to converge upon a predetermined final value;

counter means coupled to the output of the control means for counting and storing the number of N combining operations in each of said groups; and

means for subsequently entering a second number in said store;

the control means being responsive to the counter means to successively recirculate the second number in the store through the combining circuit for a plurality of groups of M combining operations, where M is an integer not greater than N, the number of M combining operations in each of said further groups being the same as the number of N combining operations in the corresponding ones of the first-mentioned groups.

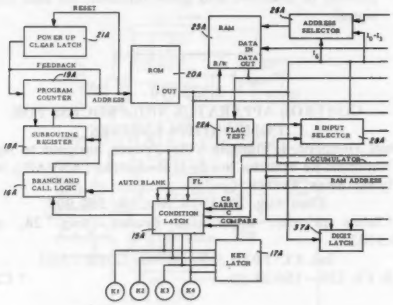
3,953,719
LATCHED DECODER FOR DIGIT OUTPUTS TO AN ELECTRONIC DIGITAL CALCULATOR DISPLAY

George L. Brantingham, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 26, 1974, Ser. No. 527,508

Int. Cl.² G06F 15/02, 3/14

U.S. Cl. 235—156 **11 Claims**



1. In an electronic calculator system having an addressable data storage means, an arithmetic unit for performing operations on data and control circuitry for providing commands which define the operation of the system, an output circuit comprising:

a. a first multi-function register means coupled to the output of said arithmetic unit for providing first coded output signals in a first coded format and addresses of said data storage means;

b. a second multi-function register means for providing second coded output signals in a second coded format and data;

c. output means having first and second sets of terminals;

d. first decoder means coupled to said output means for decoding said first coded output signals from said first coded format to a third coded format for output to said first set of terminals;

e. second decoder means coupled to said output means for decoding said second coded output signals from said second coded format to a fourth coded format for output to said second set of terminals;

f. a first set of latches coupling said first register means to said first decoder means for latching said first coded output signals in said first coded format; and

g. a second set of latches coupling said second register means to said second decoder means for latching said second coded output signals in said second coded format; wherein

h. said first and second register means are adapted to provide addresses and data, respectively, while output signals are simultaneously provided by said latches through said decoders to said first and second sets of terminals.

3,953,720
ELECTRONIC TAXIMETER FOR TAXIS TAKING A PLURALITY OF PASSENGERS ON OVERLAPPING TRIPS

Heinz Kelch, Buchenberg, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany

Filed June 25, 1974, Ser. No. 483,065

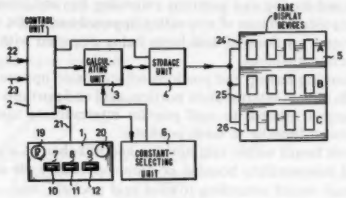
Claims priority, application Germany, June 26, 1973, 2332361

Int. Cl.² G06F 13/00, 13/04

U.S. Cl. 235—168 **12 Claims**

1. In a single taxi, an electronic taximeter comprising, in combination, fare computing means for separately computing the fares of a plurality of passengers whose respective trips

overlap, said fare computing means including coordinating means activatable for initiating computation of the fare associated with a respective passenger when such passenger enters the taxi and activatable for terminating the computation of the



respective fare when the respective passenger leaves the taxi; and fare display means connected to said fare computing means for displaying the computed fares associated with the respective passengers.

3,953,721
ANALOGUE COMPUTER FOR SOLVING POLYNOMIAL EQUATIONS

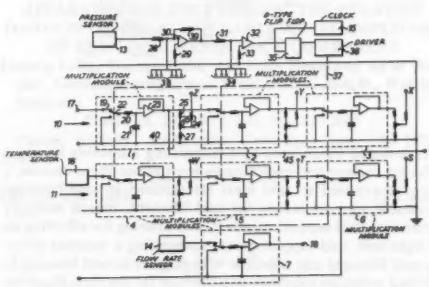
James Stewart Johnston, Bognor Regis, and Dennis George Cope, Pagham, both of England, assignors to Rosemount Engineering Company Limited, Bognor Regis, England

Filed Feb. 12, 1975, Ser. No. 549,139

Claims priority, application United Kingdom, Feb. 19, 1974, 7519/74

Int. Cl.² G06G *7/32, 7/57*

U.S. Cl. 235—180 **20 Claims**



1. An analogue computer for solving polynominal equations of the type described comprising a high gain comparator means operative to provide a common multiplier signal dependent on the difference between a composite signal and a reference level; at least two multiplication modules, each module being responsive to said common multiplier signal to provide a respective analogue output signal which is representative of the product of the magnitude of a respective analogue input signal to the respective module and the factor represented by said common multiplier signal; and means for combining the analogue output signals of at least two said modules to provide said composite signal as a negative feedback input signal to the comparator means, the gain of the comparator means being such that the computer is operative to maintain said composite signal substantially equal to said reference level.

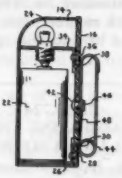
3,953,722
FLASHLIGHT SUPPORT MEANS

Gerald A. Stick, New Buffalo, Mich., assignor to Danny R. Stick, New Buffalo, Mich., a part interest

Filed Feb. 14, 1974, Ser. No. 442,443

Int. Cl.² F21V *33/00*

U.S. Cl. 240—6.4 W **7 Claims**



1. A switch circuit for a flashlight comprising:
a casing member for housing a light bulb and a battery;
spaced terminals on the exterior of said casing member; and
a garment piercing pin pivotally mounted on said casing member between said spaced terminals, said pin being rotatable relative to said casing member to contact said spaced terminals.

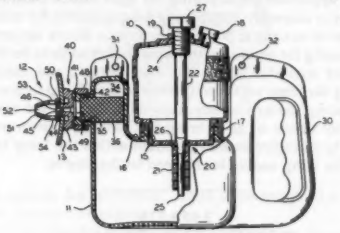
3,953,723
PLASTIC CARBIDE LAMP

Frank S. Flider, Chicago, Ill., assignor to Justrite Manufacturing Company, Chicago, Ill.

Continuation of Ser. No. 121,412, March 5, 1971. This application Sept. 8, 1972, Ser. No. 287,512

Int. Cl.² F21V *23/00*

U.S. Cl. 240—11.1 **6 Claims**



1. A carbide lamp assembly,
said assembly comprising a plastic container for retaining carbide therein,
a plastic water shell for storing water therein,
said plastic container having a generally closed smooth wall tank member,
a centrally located platform member on said tank member,
an integral upstanding internally threaded collar vertically disposed on said platform member,
said water shell having an exernally threaded section integral thereto mating with the internally threaded upstanding collar,
a centrally located hollow tube downwardly dependent from said externally threaded section,
said hollow tube terminating at its upper end in a tapered seat,
water flow control means resting in said tapered seat and extending through the top of said water shell for external control of the water flow,
a gas collecting dome section positioned near the periphery of said tank member spaced away from and rising above the level of the rest of the tank member, and

burner means connected directly to said dome section whereby gas collects therein and tubing is not required to bring gas to said burner means,

a vertical handle is integrally mounted on one of said tank member,

an upstanding horizontal fin is integrally formed on the top of said dome and said handle,

said handle and upstanding fin being separated from the interior of said tank member, and

means for securing a bale to said upstanding fin and said handle.

3,953,724

APPARATUS FOR ADJUSTING THE LIGHT SOURCE POSITION OF A LIGHT SOURCE ASSEMBLY

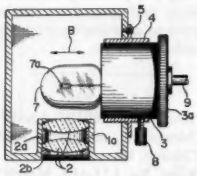
Teruo Ouchi, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan

Filed Mar. 3, 1975, Ser. No. 554,403

Claims priority, application Japan, Apr. 4, 1974, 49-38530[U]

Int. Cl.² F21V *19/02*

U.S. Cl. 240—44.2 **4 Claims**



1. An apparatus for adjusting the light source position of a light source assembly, comprising a lamp socket for mounting a lamp at an eccentric position thereon, a sleeve secured to a lamp housing for mounting the lamp socket so as to be slidable along and rotatable about the axis thereof, and means for clamping the lamp socket to the sleeve, said lamp socket being moved along the axis or angularly moved about the axis relative to the sleeve so as to bring the lamp to a given position relative to a condenser lens disposed within the lamp housing before the lamp socket is clamped to the sleeve.

3,953,725

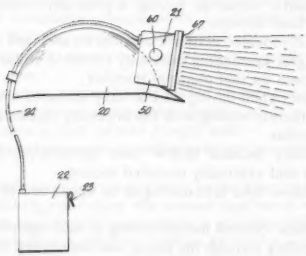
ILLUMINATING APPARATUS

Albert E. Ketler, Indiana; Ronald P. Campbell, Latrobe, and George Shacreaw, Blairsville, all of Pa., assignors to Ocean Energy, Inc., Blairsville, Pa.

Filed Apr. 22, 1974, Ser. No. 462,886

Int. Cl.² H05B *33/02*

U.S. Cl. 240—51.11 R **6 Claims**



1. Illuminating apparatus, comprising:

an oblong housing having opposed end walls,

an elongated fluorescent tube lamp within said housing and extending along the longer portion thereof, said opposed end walls of said housing having axially aligned openings therein,

a tubular insulator bushing secured within each said opening and having end portions extending beyond inner and outer side surfaces of respective opposed end walls, opposite end portions of said lamp being disposed within respective bushings,

said housing having end portions adjacent said opposed end walls and an intermediate portion, said end portions being enlarged relative to said portion intermediate said end portions thereby to form pockets,

a circuit board within said housing and attached to a wall of said intermediate housing portion, opposite ends of said circuit board extending toward said pockets, and,

electrical devices carried by said circuit board on at least one end thereof and disposed within the adjacent housing pocket.

3,953,726

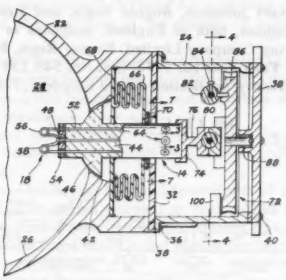
INFINITELY ADJUSTABLE LEVEL LIGHT

Frank M. Scarritt, Sr., 1338 Park St. North, St. Petersburg, Fla. 33710

Filed Dec. 6, 1974, Ser. No. 530,345

Int. Cl.² B60Q *1/06*; F21M *3/18*; F21V *7/00*, *19/02*

U.S. Cl. 240—61 **15 Claims**



1. A sealed beam lamp unit comprising a housing having a reflector surface and enclosing an inert atmosphere therein; a filament exposed to said inert atmosphere in said housing; adjustable support means for said filament, means sealingly connecting said support means to said housing for effecting an air tight unit; said support means comprising a member carrying said filament and movable with respect to said housing to selected positions to orient said filament for emitting illumination at predetermined reflected beam angles; and actuating means operatively connected to said movable support member for displacement to said selected positions.

3,953,727

SYSTEM FOR TRANSMITTING INDEPENDENT COMMUNICATION CHANNELS THROUGH A LIGHT-WAVE MEDIUM

Luigi d'Auria; Claude Puech, and Jean-Claude Reymond, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 17, 1975, Ser. No. 542,022

Claims priority, application France, Jan. 18, 1974, 74.01800

Int. Cl.² H04B *9/00*

U.S. Cl. 250—199 **9 Claims**

1. A system for transmitting independent communication channels through a light-wave medium, said system comprising, staggered on at least one transmission direction:

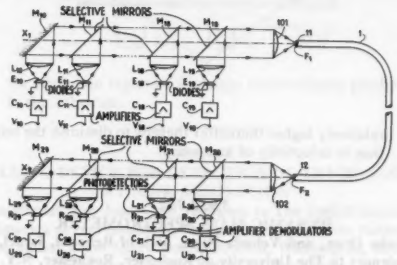
a plurality of n diodes, n being an integer at least equal to 2, said diodes producing light radiations of different wavelengths;

a plurality of n channel inputs;

a plurality of n amplifiers, supplied by said channel inputs;

a plurality of n lenses collimating light emitted by said diodes on one axis via a plurality of n parallel mirrors, $n-1$ of which are selective;

one lens focussing said collimated light on the entry of said light-wave medium;



a plurality of photodetectors;

a lens collimating the light transmitted by said medium in one axis;

a plurality of n parallel mirrors, $n-1$ of which are selective;

a plurality of n lenses focussing the light reflected by said mirrors on said plurality of photodetectors;

a plurality of n amplifier detectors supplied by said photodetectors;

a plurality of n channel outputs supplied by said amplifier detectors.

3,953,728

APPARATUS FOR DETERMINING THE RELATIVE POSITION OF THE PLANE OF MAXIMUM AMPLITUDE OF THE LOCAL FREQUENCY COMPONENT

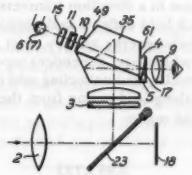
Ludwig Leitz; Werner Holle, and Knut Heitmann, all of Wetzlar, Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Oct. 24, 1974, Ser. No. 517,846

Claims priority, application Germany, Nov. 14, 1973, 2356757

Int. Cl.² G01J *1/20*

U.S. Cl. 250—201 **12 Claims**



1. In an apparatus, an imaging system, at least one optically effective grating and a photoelectric receiver system being employed for determining the relative position of the plane of maximum amplitude of a spatial frequency component in the image of an object, said imaging system having an entrace pupil, said entrance pupil having regions which are traversed by light fluxes emanating from said object, and forming an image of said object in a plurality of intermediate image planes, said grating displaying a given spatial frequency component and being mounted in at least the vicinity of one of said intermediate image planes for receiving said image and for modulating said light fluxes, said photoelectric receiver system consisting of at least two photoelectric detectors responsive to light fluxes passing said grating and generating therefrom electrical push-pull signals used in governing controlling means, the improvement comprising:

mounted in a first one of said intermediate image planes a focussing screen (3) divided into at least two areas (*3a*;*3b*); one of said areas chosen for subjectively observing and focussing said object, the other having a given size and being applied to transmit for further processing light fluxes selected from one of said regions of said entrance pupil;

located in a second one of said intermediate image planes said grating (11) jointly modulating said light fluxes traversing said selected region and having properties for splitting said light fluxes thus causing the production of at least two components being separately transferred in defined directions to said photoelectric receiver system (6,7), and

optical means (35) arranged between said focussing screen and said grating for folding the beam path.

3,953,729

AUTOMATIC FOCUS ADJUSTMENT OF A CAMERA

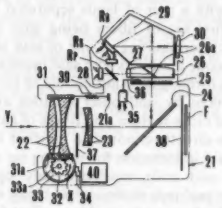
Kazuya Hosoe; Hiroshi Aizawa, both of Machida; Seiichi Matsumoto, Yokohama, and Hideo Yokota, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,572

Claims priority, application Japan, Oct. 26, 1973, 48-120556

Int. Cl.² G03B *3/10*

U.S. Cl. 250—201 **22 Claims**



1. A system for automatic focus adjustment of a photographic camera comprising:

a. an objective lens assembly for focussing an image of an object in a predetermined position said objective lens assembly including at least one lens member movable along the optical axis of the objective lens for focussing said image in said predetermined position;

b. an optical system for image sharpness detection capable of focussing an image of the same object as above, said optical system including as a component at least said movable member of the objective lens assembly; and

c. image sharpness detecting means for detecting an optimum sharpness of the image formed by said image sharpness detection optical system comprising:

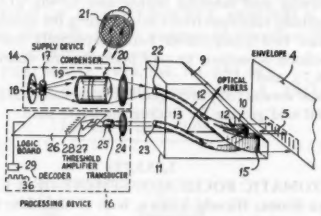
1. first and second photoelectric transducing means of different electrical response characteristics from each other with respect to the change in sharpness of the image; and

2. circuit means electrically connected to said first and second transducing means for producing an output signal proportional to the difference between the electrical responses of said first and second cell means,

wherein the focus adjustment of said objective lens assembly to selected objects in various distances is automatically effected, and wherein said first photoelectric transducing means has non-linear electrical response characteristics such that its output is increased with increase in sharpness of the image, and said second photoelectric transducing means has non-lin-

ear electrical response characteristics such that its output is decreased with increase in sharpness of the image.

3,953,730
OPTICAL READING HEAD
Guy Henry; Paul Roman, and Claude Tetevuide, all of Paris, France, assignors to Thomson-CSF Visualisation et Traitement des Informations (T-VT), Paris, France
Filed June 24, 1974, Ser. No. 482,741
Claims priority, application France, July 3, 1973, 73.24391
Int. Cl.² G02B 5/16
U.S. Cl. 250—227 **2 Claims**



1. A device for the reading of photoluminescent code markings spacedly disposed on a carrier moving along a predetermined guidepath, comprising:

a source of radiation for exciting said code markings;

a light-guiding structure including a first and a second set of optical fibers, said structure forming a ridge adjacent said guidepath with a pair of lands separated by an indentation, said first set of fibers being split into two outer bundles each terminating at one of said lands for illuminating said code markings with said radiation, said second set of fibers forming an inner bundle of rectangular cross-section flanked by said outer bundles along the major sides of said cross-section, the fibers of said inner bundle having ends directly exposed to incident light and terminating at said indentation for picking up secondary light rays from said code markings only upon movement thereof past said indentation while being shielded by said outer bundles from code markings offset from said indentation;

photoelectric transducer means positioned to receive said secondary rays from said second set of fibers for converting same into electrical signals; and

decoding means for said signals connected to said transducer means.

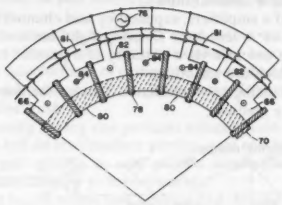
3,953,731
ISOTOPE SEPARATION UTILIZING ZEEMAN COMPENSATED MAGNETIC EXTRACTION
Harold K. Forsen, Bellevue, Wash., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.
Filed Dec. 27, 1973, Ser. No. 428,660
Int. Cl.² H01J 39/34
U.S. Cl. 250—290 **25 Claims**

1. In a system for isotope separation wherein means are provided to produce isotopically selective ionization in a particle flow of plural isotope types by pulsed photoexcitation of a selected absorption line to provide an environment having ions of at least one isotope type, apparatus for changing the flow direction of the selectively ionized particles to permit separate collection thereof comprising:

means for applying a magnetic field to the flow of particles to provide a change in the flow direction of the ionized particles therein;

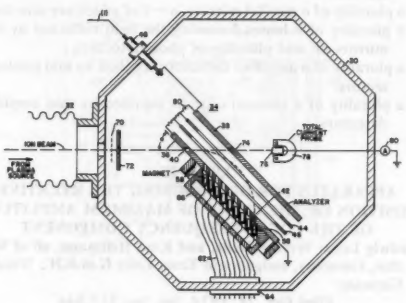
the applied magnetic field having a strength sufficient to reduce isotopic selectivity of ionization through Zeeman broadening of the selected absorption line; and

means for periodically time varying the applied magnetic field to be relatively low during pulse photoexcitation and



relatively higher thereafter thereby to diminish the reduction in selectivity of ionization.

3,953,732
DYNAMIC MASS SPECTROMETER
Moshe Oron, and Yehuda Paiss, both of Rehovot, Israel, assignors to The University of Rochester, Rochester, N.Y.
Filed Sept. 28, 1973, Ser. No. 401,883
Int. Cl.² H01J 39/34
U.S. Cl. 250—287 **26 Claims**

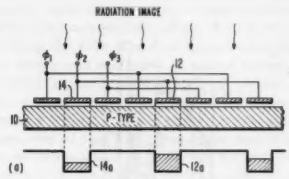


1. The method of mass spectrometry which comprises the steps of projecting a beam of particles which can have a wide range of kinetic energy into an analyzing region, establishing a field in said region in a direction transverse to the direction of said beam which field deflects said particles independently of their initial kinetic energy as they enter said region along paths of length which are dependent upon the mass and charge of said particles, and collecting said deflected particles at points spaced along said region from the place of entry of said beam into said region.

3,953,733
METHOD OF OPERATING IMAGERS
Peter Alan Levine, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.
Filed May 21, 1975, Ser. No. 579,690
Int. Cl.² H01J 31/49
U.S. Cl. 250—330 **27 Claims**

1. A method of operating an image sensing array which includes a substrate and electrodes insulated from the substrate to which a voltage may be applied during an integration time for causing radiation induced charge carriers to be collected in the regions of the substrate adjacent to the electrodes comprising the step of:

applying a voltage to said electrodes which increases with time for increasing in corresponding fashion the depth of



the depletion regions for charge accumulation produced in the substrate.

3,953,734

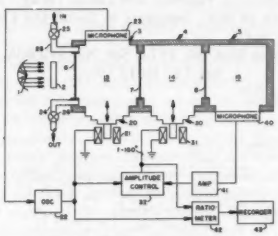
NULLING DEVICE FOR DETECTION OF TRACE GASES BY NDIR ABSORPTION

John Dimeff, San Jose, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 22, 1974, Ser. No. 526,438

Int. Cl.² G01N *21/26*

U.S. Cl. 250—343 **12 Claims**



1. A non-dispersive gas analyzing apparatus for measuring the density of a desired gas comprising:

a chamber for containing a gas to be analyzed, said chamber having a radiant energy transmissive entrance window and a radiant energy transmissive exit window opposite said entrance window;

means for impinging a modulated radiant energy beam on said entrance window, said beam being modulated at frequency f;

means for modulating the radiant energy inside said chamber that has entered via said entrance window, the modulation having a frequency f and being 180 degrees out of phase with said modulated radiant energy beam; and

means responsive to said impinging means and said modulating means for providing an output representative of the density of the desired gas contained in said chamber.

3,953,735

RADIATION SENSING DEVICE

Karl J. Stout, Lyndhurst, Ohio, assignor to Ohio Nuclear, Inc., Solon, Ohio

Continuation of Ser. No. 370,163, June 14, 1973, which is a continuation-in-part of Ser. No. 269,046, July 5, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,331

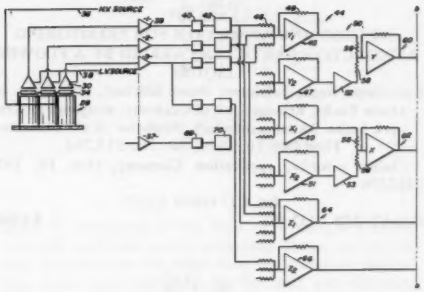
Int. Cl.² G01T *1/20*

U.S. Cl. 250—363 S **20 Claims**

1. A radiation sensing device for producing positional information that is an accurate indication of the location of radiation comprising:

means for forming a visible response from radiation;

means for converting the visible response from radiation to electrical impulses including at least three photomultiplier tubes positioned substantially adjacent to and on one side of the means for forming in order that the photomultiplier tubes receive radiation, view common radiation and give electrical impulses as a result thereof, the proximity of the photomultiplier tubes to the means for forming a visible response causing distortion of the relation of the electrical impulses to the location of the radiation;



means for operating on the electrical impulses operatively connected to the means for converting to create a signal which gives an accurate indication of the relative location of the radiation, the means for operating including a non-linear circuit which gives an output which is not directly proportional to an input signal in order to correct for the distortion, the means for operating including a biasing device for adjusting the gain about a predetermined threshold value, the gain being less above the threshold value than below it.

3,953,736

METHOD OF AND APPARATUS FOR MEASURING THE THICKNESS OF OBJECTS

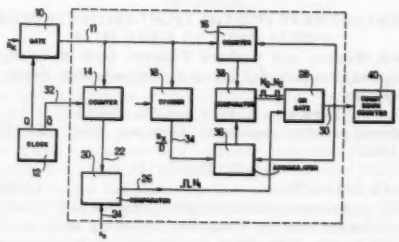
Helmut Kubisiak, Leverkusen, and Dietrich Sorgenicht, Opladen, both of Germany, assignors to Exatest Messtechnik, Opladen, Germany

Filed Oct. 17, 1974, Ser. No. 515,471

Claims priority, application Germany, Oct. 19, 1973, 2352522

Int. Cl.² G01J *1/00*

U.S. Cl. 250—358 R **15 Claims**



1. A method of determining the value of a variable, the variation of which has an effect which varies according to an exponential function, the amplitude of this effect being known, comprising the steps of:

presetting a counter to a predetermined count corresponding to a predetermined extreme value of said variable;

generating a sequence of pulses the number of which is representative of the known amplitude of this effect;

counting the pulses in said sequence and generating a pulse each time the number of pulses in said sequence corresponds to a predetermined standard value unit of said variable and

modifying the count of said preset counter by a predetermined count at each pulse so generated, whereby at the end of said sequence the counter displays a count which corresponds to the value of said variable.

3,953,737

METHOD AND APPARATUS FOR MONITORING RADIOACTIVE PARTICLES CARRIED BY A FLOWING LIQUID

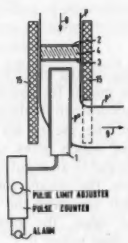
Karl-Heinz Neeb, Erlangen; Heinz Stöckert, Nurnberg, and Armin Fuchs, Erlangen, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Oct. 10, 1974, Ser. No. 513,754

Claims priority, application Germany, Oct. 18, 1973, 2352376

Int. Cl.² G01N *23/12*

U.S. Cl. 250—432 R **4 Claims**



1. Method for monitoring radioactive nuclides carried by a flowing liquid, by immersing in the flowing liquid a radiation detector producing pulses in response to radiation; wherein the improvement comprises filtering and collecting the radioactive nuclides from said flowing liquid continuously upstream from said detector to form an increasing collection of the radioactive nuclides at a position within effective range of said detector so that said detector produces pulses at an increasing rate dependent on the radioactivity of said collection, said pulses being fed to a pulse counter having an alarm activated by a pulse count of adjustable count limit, and said limit being adjusted upward as said collection increases with time.

3,953,738

ARRANGEMENT FOR THE LIGHT-PROJECTION OF INDICIA ONTO AN X-RAY FILM

Robert Hüttner, and Gerhard Kütterer, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

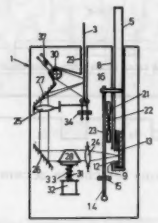
Filed Mar. 6, 1975, Ser. No. 556,114

Claims priority, application Germany, Mar. 16, 1974, 2412802

Int. Cl.² H05G *1/28*

U.S. Cl. 250—475 **6 Claims**

1. In an arrangement for the light-projection of indicia from a data carrier onto an X-ray film, including an X-ray film cassette having a light-sealed closable window, said X-ray film being positioned in said film cassette; an installation adapted to have said film cassette and said data carrier inserted therein; means in said installation for opening said window of the inserted film cassette; a light source for illuminating said inserted data carrier; optical means for projecting the illuminated indicia on said data carrier through the open window of said film cassette onto the X-ray film located in said film cassette; and switch means for initiating said illumination, the improvement comprising: a dove prism in said installation;



and actuator means for selectively interposing said dove prism in the optical path of said optical projecting means for effecting the non-reversed projection of the data onto said X-ray film for posterior anterior and for anterior posterior exposures.

3,953,739

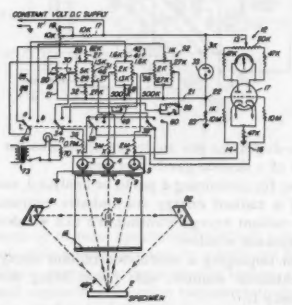
METHOD AND APPARATUS FOR THE CONTINUOUS MONITORING AND CONTROL OF CELL SIZE IN A FOAM STRUCTURE

Edward A. Colombo, Fairport, and James Tarng Tsai, Canandaigua, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 30, 1974, Ser. No. 510,666

Int. Cl.² H01J *39/12*

U.S. Cl. 250—571 **2 Claims**



1. A method for determining the average individual cell size of a plastic foam sheet which comprises illuminating the surface of said foam, receiving and collecting at least a portion of the light which is diffused from said foam with a detector photocell, electrically measuring the amount of light energy received by said photocell whereby said light energy measurement is directly converted to said cell size.

3,953,740

REMOTE POWER SUPPLY UNITS FOR VEHICLES

Charles J. Seiter, Jr., Dallas, Tex., assignor to Cliff Granberry Corporation, Dallas, Tex.

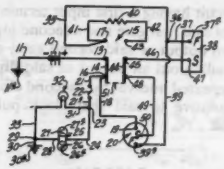
Filed Sept. 30, 1971, Ser. No. 185,239

Int. Cl.² H02J *1/00*

U.S. Cl. 307—10 R **6 Claims**

1. A remote power supply unit for vehicles for connection in the regular alternator electrical system of such vehicle to supply electrical power to a remote outlet for the operation of electric power tools, said unit being adapted for attachment to

a vehicle having an electrical circuit including a battery, an alternator having an output terminal, and a voltage regulator with a switch controlled ignition, lights and accessory circuit connecting the voltage regulator, battery and the alternator in the usual manner, said remote power supply unit comprising: a remote outlet load connection; single double throw switch means comprising the sole electrical circuit switching means in said power supply unit and having a pair of movable switching blade means engageable with a first pair of contact means at a first throw position and movable simultaneously to be engageable with a second pair of contact means at its second throw position; one of said switching blade means when in a first throw position electrically connecting the output terminal of the alternator with the remote outlet load connection and with the battery; the other movable switching blade means when in said first throw position connecting the stator connec-



tion of the voltage regulator to the stator connection of the alternator; said one movable switching blade means when moved to said second throw position disconnecting the output terminal of the alternator from said battery; and leaving only said remote outlet load connection connected to the power output of the alternator; said remote outlet load connection being connected with said power output of said alternator at all times; said other movable switching blade means when moved simultaneously with said one switching blade means to said second throw position disconnecting the stator connection of the voltage regulator of the electrical circuit of the vehicle from the stator connection of the alternator and connecting said stator connection of said voltage regulator with the battery for operation of the electrical circuit of the vehicle for operation of the vehicle to supply power to the alternator for driving the same to supply electrical energy to the remote outlet receptacle.

3,953,741

STEPWISE CONTROL FOR TWO-STEP CONTROL WITH SWITCHING STAGES

Urs Winkelmann, Jona, Switzerland, assignor to Stata-Control System SCS AG, Stata, Switzerland

Continuation of Ser. No. 315,308, Dec. 15, 1972, abandoned. This application Dec. 19, 1974, Ser. No. 534,289

Claims priority, application Switzerland, Dec. 17, 1971, 18468/71

Int. Cl.² H02J *1/00, 3/00*

U.S. Cl. 307—87 **8 Claims**

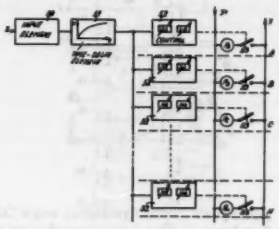
1. A stepped control system for two-point control, comprising:

input means delivering an input signal characteristic for a control magnitude;

a plurality of two-point switching devices connected with said input means, each switching device including: on-off switch means having connections for a load; excitation means cooperating with said on-off switch means, said excitation means being responsive to said input signal for switching on and switching off the switch means at a first and a second level of said input signal; and control means determining the first and the second input signal level by fixing a switching-on and a switching-off response threshold for said excitation means, the difference between the switching-on and the switching-off threshold defining a switching hysteresis-width of the switching device;

said switching devices have hystersis-widths which differ from one another and have switching-on and switching-off thresholds which respectively increase and decrease for the different switching devices according to the sequence of their increasing hysteresis-widths; and

a plurality of loads connected separatively to said on-off switch means of said plurality of switching devices, each load having a predetermined strength, whereby with the first switching device having the smallest hysteresis-width



there is connected a first load of a certain smallest strength, with the second switching device having the next greater hysteresis-width there is connected a second load of the same strength as the first load, and with each further switching device having a greater hysteresis-width there is connected a further load the strength of which is not greater than the sum of strengths of loads connected with the switching devices preceding said further switching device.

3,953,742

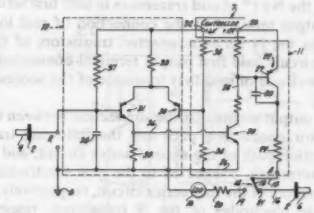
CATHODIC PROTECTION MONITORING APPARATUS FOR MARINE PROPULSION DEVICE

Edward P. Anderson, Fond du Lac, and Mark Harris, Brownsville, both of Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed July 17, 1974, Ser. No. 489,147

Int. Cl.² H01B *7/28*

U.S. Cl. 307—95 **16 Claims**

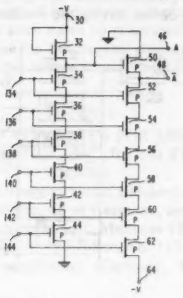


1. In a cathodic protective apparatus for a submergible metal unit subject to corrosion including a current supply means for providing a cathodic protection current, a powered submergible anode means and a submergible reference electrode means connected in a cathodic protection circuit to maintain the potential of the metal unit at a selected level, an indicating means, test means coupled to said cathodic protection circuit and including current control means connected to operably open the circuit to one of the anode means and reference electrode means and producing a change in the cathodic protection current from said supply means related to the proper cathodic protection functioning, said control means further connecting said indicating means to said current supply means to monitor said change in the cathodic protection current.

3,953,743
LOGIC CIRCUIT

Richard James Hollingsworth, Hopewell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1975, Ser. No. 553,637
Int. Cl.² H03K *19/08, 19/22, 19/36, 19/40*
U.S. Cl. 307—205 **4 Claims**



1. The combination of an N input logic circuit and an inverter comprising:

a first terminal for an operating voltage at a level representing one binary value and a second terminal for an operating voltage at a level representing the other binary value;

load means; 'N MOS transistors of one conductivity type each having a conduction path and a gate electrode, said conduction paths connected in series with said load element to form a first series circuit, said first series circuit including at one end said load element and connected at that end to said first terminal and said first series circuit connected at its other end to said second terminal;

N+1 MOS transistors of the same conductivity type as the MOS transistors of the first series circuit, each of the N+1 transistors having a conduction path and a gate electrode, the conduction paths of the N+1 transistors connected in series to form a second series circuit, said second series circuit connected at the one end having the first of said transistors to said second terminal and at the other end having the N+1th of said transistors to said first terminal;

a first output terminal at the connection of said load element to the N series connected transistors of the first series circuit, said first output terminal connected to the gate electrode of said first transistor of the second series circuit;

a second output terminal at the connection between the first transistor conduction path and the following transistor conduction path of the second series circuit; and

N input terminals, connected to the gate electrodes of the N transistors of the first series circuit, respectively, and to the gate electrodes of the N transistors, respectively, other than the first transistor, of the second series circuit.

3,953,744
CIRCUIT FOR CONVERTING AN ASYNCHRONOUS SIGNAL WITH A LONG TRANSITION TIME TO A SYNCHRONIZED SIGNAL

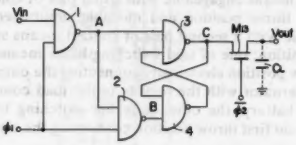
Hiroto Kawagoe, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 14, 1974, Ser. No. 432,835
Claims priority, application Japan, Jan. 12, 1973, 48-5978
Int. Cl.² H03K *19/08, 5/13*
U.S. Cl. 307—208 **4 Claims**

1. A synchronizer circuit comprising:

a first gate having a first input terminal for receiving a first clock pulse and a second input terminal for directly receiving an asynchronous input signal, the interval of time during which said asynchronous input signal travels between two prescribed levels being longer than the period of said first clock pulse;

a second gate having a first input terminal for receiving said first clock pulse and a second input terminal for receiving an output of said first gate, said first and second gates being enabled in a first repeated interval by said first clock pulse;



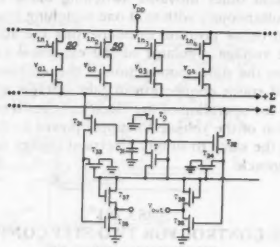
a flip-flop circuit having a first input terminal for receiving an output of said first gate and a second input terminal for receiving an output of said second gate; and

means for reading out an output of said flip-flop circuit in a second repeated interval by a second clock pulse shifted in phase relative to said first clock pulse of opposite polarity and.

3,953,745
CHARGE TRANSFER DEVICE SIGNAL PROCESSING SYSTEM

Walter H. Bailey, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 320,382, Jan. 2, 1973, Pat. No. 3,877,056.
This application Dec. 19, 1974, Ser. No. 534,262
Int. Cl.² H03K *25/00;* **G11C** *19/28*
U.S. Cl. 307—221 C **10 Claims**



1. A programmable matched filter comprising:

a. delay line means having a plurality of stages each defining at least one signal storage node;

b. for each said stage, detector means connected with a said storage node of said stage for non-destructively sampling signals stored at said stage and producing a corresponding detected signal at an output of said detector means;

c. a negative signal summation bus and a positive signal summation bus for simultaneously receiving selected ones of said detected signals;

d. switching means connected to said output of each of said detector means for selectively connecting said output to either said negative summation bus or to said positive summation bus responsive to a logic signal applied to said switching means;

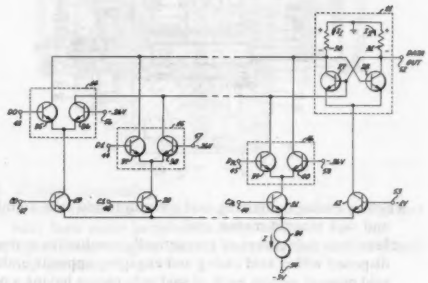
e. selectively controllable logic means connected to said switching means for simultaneously applying said logic signals to said switching means in a code corresponding to a selectable matched filter function; and

f. output means connected to said summation buses for algebraically summing said detected signals selectively connected to said negative and positive buses.

3,953,746
SELECTOR LATCH GATE

Darrell L. Fett, Scottsdale, Ariz., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed July 29, 1974, Ser. No. 484,373
Int. Cl.² H03K *17/60, 3/286;* G11C *15/04*
U.S. Cl. 307—247 R 2 Claims



1. A current steering selector latch gate for use with a source of data signals, a source of gating signals and a current source, said gate comprising:

latching circuit means having a current in terminal, a current out terminal, a data out terminal, and a complementary data out terminal;

n upper level current steering switches, where *n* is an integer greater than one, each switch having first and second current in terminals, a data input terminal, a reference voltage terminal, and a current out terminal;

a lower level current steering switch having a reference voltage terminal, *n* gate input terminals, $n + 1$ current in terminals, and a current out terminal;

the first current in terminal of each of the upper level current steering switches connected to a data out terminal of the latching circuit, the second current in terminal of each of the upper level current steering switches connected to the other data out terminal of the latching circuit;

the current out terminals of the upper level current steering switches connected respectively to *n* current in terminals of the lower level current steering switch, the current out terminal of the latching circuit connected to the $n + 1$ current in terminal of the lower level current steering switch;

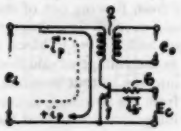
the current out terminal of the lower level current steering switch and the current in terminal of the latching circuit adapted to be connected to the current source so that electrical current can flow through the current steering selector latch gate; and

the reference voltage terminals of the upper and lower level current steering switches adapted to be connected to a source of reference voltages, each data input terminal of the upper current steering switches adapted to be connected to the source of data signals and each gate input terminal of the lower level current steering switch adapted to be connected to a source of gating signals.

3,953,747
AC WAVE SWITCHING CIRCUIT USING AT LEAST ONE SWITCHING TRANSISTOR

Kouichi Sekiguchi, Asaka, Japan, assignor to Iwasaki Tsushinki Kabushiki Kaisha, Japan

Filed Feb. 6, 1974, Ser. No. 439,984
Claims priority, application Japan, Feb. 10, 1973, 48-16118; July 18, 1973, 48-80315
Int. Cl.² H03K *17/00*
U.S. Cl. 307—253 20 Claims



1. An AC wave switching circuit, comprising:

a circuit loop for receiving an AC signal to be switched;

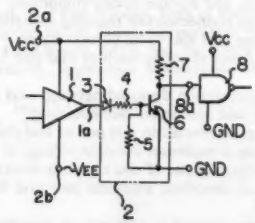
a switching transistor having the collector-emitter path thereof inserted in series in said circuit loop; and

control voltage source means for providing a DC current greater than a peak value of the AC signal current and connected across the base-emitter path of the switching transistor, so that the switching of the AC signal is performed by controlling the voltage of the control voltage source means without flowing any DC current in the collector-emitter path of the transistor.

3,953,748
INTERFACE CIRCUIT

Akio Sugiura, Nagoya; Atsutoshi Okamoto, Toyohashi, and Motoyoshi Suzuki, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 338,609, March 6, 1973, Pat. No. 3,860,830. This application Nov. 6, 1974, Ser. No. 521,447
Claims priority, application Japan, Mar. 10, 1972, 47-25093
The portion of the term of this patent subsequent to Jan. 14, 1992, has been disclaimed.
Int. Cl.² H03K *17/60*
U.S. Cl. 307—253 1 Claim



1. An interface circuit comprising in combination:

a first dc voltage supply means for supplying a dc voltage;

a second dc voltage supply means of low current and voltage capacity operative to invert the voltage from said first dc voltage supply means into a dc voltage having the opposite polarity and lower level than that of the voltage from said first dc voltage supply means;

a linear integrated circuit energized by the voltages from said fist and second voltage supply means and having an output terminal to develop an output signal, the voltage of opposite polarity from said second dc voltage supply means being applied to cancel the threshold voltage of the linear integrated circuit;

a digital integrated circuit having an input terminal; and

a switching circuit for connecting said linear integrated circuit to said digital integrated circuit, comprising a dc current blocking means connected to the output terminal of said linear integrated circuit, a transistor having a base connected to said dc current blocking means and a collector connected to the input terminal of said digital integrated circuit and being connected through a load resistance to said first dc voltage supply means, said blocking means serving to block a dc current of the same polarity as the opposite polarity voltage of said second dc voltage source from flowing out of the linear integrated circuit from said second dc voltage source toward the switching circuit and serving to block a dc current of the same polarity as the voltage of said first dc voltage supply from flowing into the output terminal of the linear integrated circuit from the switching circuit, thereby interfacing the linear integrated circuit and the digital integrated circuit with a minimized consumption of the power from the second dc voltage supply means.

3,953,749
BINARY CIRCUITRY INCLUDING SWITCHING ELEMENTS UTILIZING SUPERCONDUCTIVE TUNNELING EFFECTS

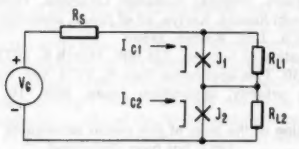
Werner Baechtold, Somers, N.Y., and Pierre L. Gueret, Richterswil, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1974, Ser. No. 528,963

Claims priority, application Switzerland, Dec. 13, 1973, 17501/73

Int. Cl.² H03K *3/38*

U.S. Cl. 307—277 **27 Claims**



1. A switching and storage circuit comprising:

a pair of series connected self-resetting Josephson elements each having zero and finite voltage states,

a load impedance shunting each of said pair of Josephson elements,

a common connection disposed between said load impedances and said Josephson elements, and

voltage means connected to said pair of Josephson elements for applying a maximum constant voltage of the order of the gap voltage of one of said elements thereto which sets one of said Josephson elements into said finite voltage state, and

control means coupled to said pair of Josephson elements for switching said one element from said finite voltage state to the zero voltage state and the other of said pair of elements from the zero voltage state to the finite voltage state.

3,953,750
ELECTRIC MOTOR

James R. Hendershot, Jr., Amherst, N.H., assignor to Vibrac Corporation, Chelmsford, Mass.

Filed Dec. 20, 1974, Ser. No. 535,033

Int. Cl.² H02K *1/18*

U.S. Cl. 310—154 **13 Claims**

1. An electric motor, comprising:

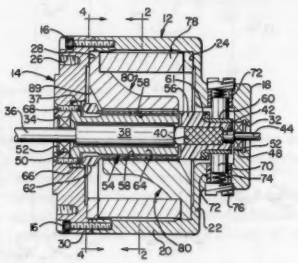
a rotatable output shaft;

a hollow armature concentrically mounted on said shaft so that at least a portion of said armature is radially spaced from said shaft;

means for electrically energizing said armature;

a stationary, magnetically-conductive core member extending into the space provided between said armature and said shaft;

magnet means for producing a magnetic field, said magnet means being mounted outside of and spaced radially from said armature;



a hollow casing containing said armature, said core member and said magnet means; and

at least two pole pieces of magnetically conductive material disposed within said casing and engaging opposite ends of said magnet means, each of said pole pieces having a pole section which extends axially in the space between said armature and said magnet means and is radially spaced from said armature and said magnet means.

3,953,751
MOTOR AND MOUNTING THEREOF

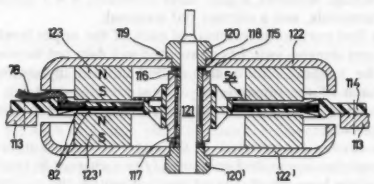
Alfred Merkle, St. Georgen; Fritz Schmieder, Hornberg, and Werner Heinzmann, St. Georgen, all of Germany, assignors to Papst Motoren KG, St. Georgen im Schwarzwald, Germany

Division of Ser. No. 285,520, Aug. 31, 1972, Pat. No. 3,845,339. This application Oct. 11, 1974, Ser. No. 514,282

Claims priority, application Germany, Sept. 1, 1971, 2143752

Int. Cl.² H02K *5/04*

U.S. Cl. 310—91 **12 Claims**



1. In combination, a support structure for a motor; a motor comprising a stator and a rotor, said stator comprising a generally plate-shaped winding arrangement comprised of a generally plate-shaped winding support arrangement connected to and supported by said support structure for said motor, and said winding arrangement further including a plurality of windings supported on said generally plate-shaped winding support arrangement, said stator further comprising a central support portion supported by said plate-shaped winding support arrangement, and said rotor comprising a rotor shaft supported on said central support portion and extending transversely to said generally plate-shaped winding arrangement, said rotor further comprising permanent magnet means and a

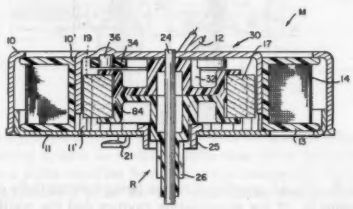
magnetic return structure mounted on said rotor shaft for rotation therewith.

3,953,752

PERMANENT MAGNET ROTOR FOR A SYNCHRONOUS MOTOR AND METHOD OF MAKING SAME

Albert C. Bannon, Indianapolis, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Mar. 16, 1973, Ser. No. 342,072
Int. Cl.² H02K 21/12
U.S. Cl. 310—156 8 Claims



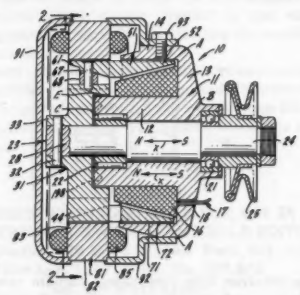
1. A rotor comprising:
a. a hub including at least two sections bonded together near their outer peripheries only, and
b. a permanent magnet carried about said perpheries of said two sections.

3,953,753

THREE PHASE ALTERNATORS

Edward L. Barrett, 506 Malden Ave., LaGrange Park, Ill. 60525

Filed Jan. 20, 1975, Ser. No. 542,114
Int. Cl.² H02K 19/20
U.S. Cl. 310—168 17 Claims



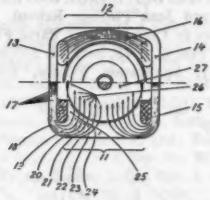
1. A three-phase dynamoelectric machine, of the kind comprising a rotor having two sets of oppositely polarized magnetic rotor poles interleaved with each other in an annular array, and a stator core of high-permeability magnetic material having a plurality of stator teeth separated from each other by a corresponding plurality of stator slots, the stator teeth forming an annular array concentric with the rotor poles and displaced therefrom by an air gap, the machine further including an electrical stator winding comprising:
first, second and third winding sections, each winding section including a given number of electrically conductive coils mounted in the stator slots, each coil encompassing just two stator teeth and separated from the next adjacent coil in the same winding section by at least one stator tooth not encompassed by a coil of that winding section, each winding section being angularly displaced around the stator core relative to each of the other two winding sections.

3,953,754

STATOR FOR ELECTRIC MACHINES

Stig Lennart Hallerback, Vastra Frolunda, Sweden, assignor to SKF Industrial Trading and Development Co., B.V., Jutphaas, Netherlands

Filed Dec. 3, 1973, Ser. No. 420,877
Claims priority, application Sweden, Dec. 18, 1972, 16772/72
Int. Cl.² H02K 1/12
U.S. Cl. 310—259 7 Claims



1. A stator for electric motors including a rotor and consisting of at least a pair of stacks each comprised of a plurality of laminations forming a yoke component in the axial plane of the motor and having pole portions extending from opposite sides of the yoke component arranged with their sides in the direction of the rotor axis, windings surrounding the yoke components, means defining an open air gap between the yoke components and the rotor, the terminal portions of the laminations running in the axial direction being bent inwardly towards a stator bore and the outer edges thereof maintained in spaced-apart relation at positions predetermined with regard to the magnetic flux lines and being permanently fixed in this position solely by means of a moulded compound, said edge portions facing the stator bore and being disposed on the periphery of a circular cylinder defining the stator bore, each lamination stack consisting of undivided laminations comprising a north and a south pole, each main pole consisting of the lamination edges of two adjacent lamination stacks.

3,953,755

HIGH PRESSURE GAS DISCHARGE LAMP INCLUDING A HYDROGEN GETTER

Gijsbert Kuus, and Piet Wiedijk, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,948
Claims priority, application Netherlands, Nov. 15, 1973, 7315641
Int. Cl.² F04B 37/02; H01J 61/26
U.S. Cl. 313—174 13 Claims

1. A high-pressure gas discharge lamp including a sealed, translucent discharge vessel containing an aggressive gas filling and being provided with electrodes between which the

discharge takes place during operation, and a hydrogen getter located within the discharge vessel and consisting of a getter material surrounded by a hydrogen-permeable wall, characterized in that the getter material comprises at least a material of the group yttrium, lanthanum, the lanthanides and alloys of the said elements and that the hydrogen-permeable wall comprises at least one of the elements chromium, molybdenum, tungsten, tantalum, nickel and iron.

3,953,756

MATRIX FOR GAS DISCHARGE DISPLAY PANELS

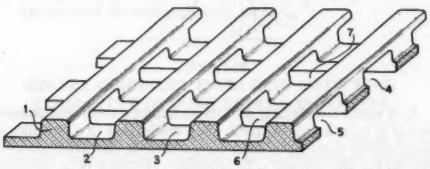
Henri Monfroy, and Jean Philippe Reboul, both of Paris, France, assignors to Thomson-CFS, Paris, France

Filed Feb. 6, 1975, Ser. No. 547,603

Claims priority, application France, Feb. 12, 1974, 74.04656

Int. Cl.² H01J *61/30*

U.S. Cl. 313—220 **5 Claims**



1. A matrix for a gas discharge display panel, comprising an insulating plate each of whose two large faces contains an array of mutually parallel grooves, the grooves of one of said two groove arrays being right-angles to those of the other of said two groove arrays and the depth of the grooves in each of the said two groove arrays being such that the matrix is perforated from one of its two large faces to the other at the zones where the grooves of the two arrays intersect.

3,953,757

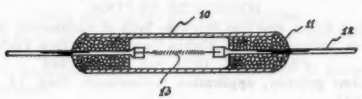
SOLDER SEALED LIGHT BULB

Robert Johan Ney, 484 Braves Trail Lane, Media, Pa. 19063

Filed Feb. 26, 1975, Ser. No. 553,233

Int. Cl.² H01K *1/38*

U.S. Cl. 313—222 **2 Claims**



1. An incandescent light bulb comprising an envelope of insulating material, a filament contained within said envelope, said filament having its conductive extremities extending beyond said envelope, said filament extremities are sealed to said envelope by a solder glass or metal solder with flow temperatures substantially below that of said envelope.

3,953,758

MULTIPERIODIC LINEAR ACCELERATING STRUCTURE

Duc Tien Tran, Paris, France, assignor to C.G.R.-Mev., Paris, France

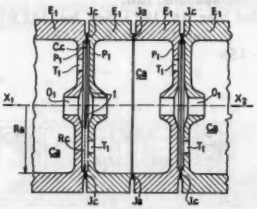
Filed Jan. 14, 1975, Ser. No. 540,942

Claims priority, application France, Jan. 15, 1974, 74.01284

Int. Cl.² H01J *23/20*

U.S. Cl. 313—360 **9 Claims**

1. A multiperiodic linear accelerating structure for accelerating a beam of charged particles along an axis X_1X_2 by means of the action of an electromagnetic energy injected within said structure, said structure, comprising a succession of accelerating resonant cavities of a cylindrical shape and having said axis X_1X_2 as revolution axis, and coupling means for coupling two consecutive accelerating cavities, said coupling means comprising at least coupling cavities C_c, of cylindrical shape having the axis X_1X_2 as axis of revolution, each coupling cavity C_c, being disposed between two accelerating cavities C_a, the



radius R_c of said coupling cavities being substantially equal to the radius R_a of the accelerating cavities and the width of the coupling cavities, measured in a direction parallel to the axis X_1X_2, being greater in the axial region, where the electrical component of the electromagnetic field produced by said electromagnetic energy is preponderant, than in the peripheral region.

3,953,759

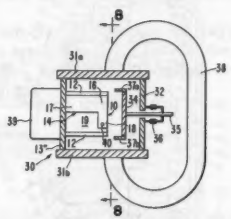
INTERDIGITAL SLOW WAVE CIRCUIT FOR ELECTRON TUBES

George K. Farney, Boxford; Andrew S. Wilczek, Beverly, and Roger A. LaPlante, Ipswich, all of Mass., assignors to Varian Associates, Palo Alto, Calif.

Filed Mar. 20, 1975, Ser. No. 560,665

Int. Cl.² H01J *25/34*

U.S. Cl. 315—3.5 **9 Claims**

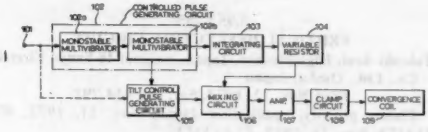


1. An electron tube comprising: vacuum envelope means, cathode means for producing a stream of electrons, guiding means for directing said stream of electrons over an elongated path, slow wave circuit means adjacent at least part of said path in energy exchanging relation with said stream, means for coupling high frequency energy output from said circuit means, said circuit means comprising; an array of conductive fingers spaced periodically in the direction of mean flow of said stream, said fingers having interaction faces adjacent said stream, first and second conductive straps at opposite ends of said fingers extending in said direction of flow, successive fingers being conductively joined alternatingly to said first and said second straps respectively to form first and second interdigital sets, a conductive wall extending in the direction of said stream and disposed from said interaction faces opposite said stream, a portion of the length of each finger extending as a vane to join said wall, said portion extending to one end of said finger and substantially short of the other end, said one end being a corresponding end of each finger in said first set and the opposite end of each finger in said second set.

3,953,760
DYNAMIC ELECTRON BEAM CONVERGENCE APPARATUS

Toshiro Matsuura, Moriguchi, and Minoru Takeda, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Apr. 10, 1974, Ser. No. 459,856
Int. Cl.² H01J 29/51
U.S. Cl. 315—13 C **19 Claims**



11. A dynamic convergence apparatus for a color television reproducing system to which a deflection drive pulse is provided as a pulse separate from the color component signals or is a synchronizing pulse for the system, said apparatus comprising:

input circuit means to which said deflection drive pulse is supplied;

controlled pulse generating means coupled to said input circuit means for responding to the output thereof for generating a controlled pulse the position of the leading edge of which is adjusted to correspond to that of said deflection drive pulse and the pulse width of which is no longer than a flyback period of the color television reproducing system;

sawtooth voltage generating means coupled to said controlled pulse generating means for responding to said controlled pulse for generating a sawtooth voltage;

first control circuit means coupled to said controlled pulse generating means for generating a tilt control pulse which is synchronized with said deflection drive pulse and the polarity and amplitude of which are controllable;

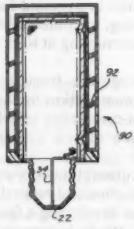
second control circuit means coupled to said sawtooth voltage generating means for controlling the amplitude of said sawtooth voltage; and

circuit means coupled to said first and second control circuit means for responding both to said tilt control pulse and said amplitude controlled sawtooth voltage for generating a parabola current which flows through a convergence coil.

3,953,761
FLUORESCENT LIGHT BULB FOR USE IN CONVENTIONAL INCANDESCENT BULB FIXTURE

Thomas Lo Giudice, 520 E. 72 St., New York, N.Y. 10021

Filed Apr. 3, 1974, Ser. No. 457,656
Int. Cl.² H01J 61/00
U.S. Cl. 315—71 **6 Claims**

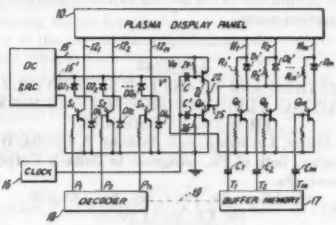


1. A fluorescent light bulb adapted for use in an incandescent lamp fixture comprising, a central ballast, a socket plug electrically connected to said ballast and adapted to be received in the socket of an incandescent lamp fixture, and a fluorescent tube containing a gas discharge vapor and having an interior surface coated with a fluorescent material, said tube comprising means defining a relatively flat toroid which is generally complementary to the periphery of said ballast and surrounding said central ballast and being electrically connected to said ballast thereby to form a compact fluorescent light bulb assembly.

3,953,762
CIRCUIT FOR SUPPLYING A SPECIFIED ONE OF PLURAL EXTERNAL ELECTRODES OF A GAS DISCHARGE DISPLAY PANEL WITH UNIDIRECTIONAL FIRING VOLTAGE PULSES AND FOR SUPPLYING OTHERS WITH PULSES OF A REDUCED VOLTAGE

Tsunekiyo Iwakawa, and Akira Yano, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1974, Ser. No. 509,047
Claims priority, application Japan, Oct. 3, 1973, 48-111307
Int. Cl.² H05B 37/00
U.S. Cl. 315—169 TV **12 Claims**



6. In combination in driving circuit apparatus for plasma display including first and second selection electrode pluralities, first and second potential source means, the potential of said first source exceeding that of said second source, plural first switching transistors having their collector-emitter conduction paths connected in parallel between said first and second potential sources and adapted for connection to different ones of the first display electrodes, a first transistor for connecting said first potential source to the first electrodes and to said first plural switching transistors, a second transistor for grounding the first electrodes, and plural second switching transistors for selectively grounding a different one of the second electrodes.

3,953,763
PULSED XENON ARC LAMP OPERATING CIRCUIT

Phillip R. Herrick, Fort Wayne, Ind., assignor to General Electric Company, Indianapolis, Ind.

Filed Apr. 23, 1975, Ser. No. 570,689
Int. Cl.² H05B 41/34, 41/29
U.S. Cl. 315—262 **29 Claims**

8. A circuit for repetitive pulsed operation of an arc discharge lamp, comprising:

first and second input terminals for connection to a DC electrical energy source;

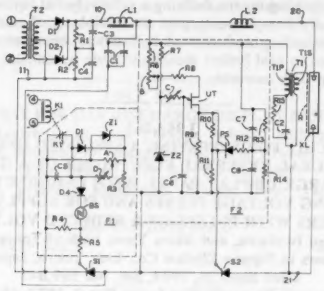
first and second input terminals for connection to the lamp;

first and second semiconductor switches connected serially between the second input terminal and the second output terminal, each switch having a conducting and a non-conducting state, the swithces arranged for alternate conduction;

first and second inductors connected serially between the first input terminal and the first output terminal, the first inductor aiding in the turn-off of the first switch and the second inductor aiding in the turn-off of the second switch;

high voltage (HV) generation means connected in circuit for providing HV pulses for ionizing the lamp;

a capacitor connected in circuit to be charged from the DC energy source through the first inductor upon turn-on of

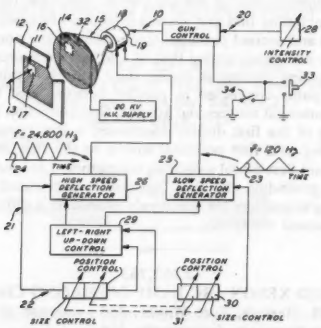


the first switch, and upon turn-on of the second switch to become discharged through the second inductor to provide an operating current pulse for the lamp and further, upon conduction of the second switch to energize the HV generation means.

3,953,764
METHOD AND MEANS FOR SELECTIVELY POSITIONING A LIGHT SOURCE FOR ILLUMINATING FILM TRANSPARENCIES

Edward Miller, Levittown, and Anthony P. Latella, Huntingdon Valley, both of Pa., assignors to Delta-X Corporation, Levittown, Pa.

Filed Sept. 29, 1971, Ser. No. 184,850
Int. Cl.² H01J *29/70*
U.S. Cl. 315—386 **5 Claims**



1. A light source for illuminating a film transparency from one side to permit an observer to view the image on the transparency from the other side, said source comprising:

a cathode-ray tube having a target screen facing said one side of said transparency and an electron gun for producing a beam of electrons that impinge upon an elemental area of said screen illuminating said screen;

a first deflection means for deflecting the beam of said cathode-ray tube along a first predetermined direction at a first predetermined frequency;

a second deflection means for deflecting the beam of said cathode-ray tube along a second predetermined direction substantially perpendicular to said first predetermined direction at a second predetermined frequency, said second predetermined frequency being substantially greater than said first predetermined frequency, said first and second deflection generators both being operative to cause said beam to scan said screen defining an illuminated raster for illuminating at least a portion of said film transparency, said beam being on continuously during the generation of the raster;

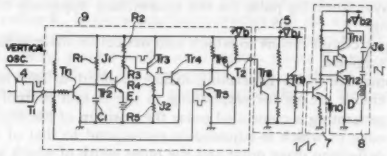
control means, said control means supplying control signals to said first and second deflection means to control the position of said raster on said screen; and

means for supplying signals to said first and second deflection means to control the size of said raster on said screen thereby enabling the illumination of a predetermined portion of said film transparency.

3,953,765
VERTICAL DEFLECTION CIRCUIT

Takeshi Arai, Higashiosaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Nov. 12, 1973, Ser. No. 414,792
Claims priority, application Japan, Nov. 11, 1972, 47-113372; Nov. 11, 1972, 47-113373
Int. Cl.² H01J *29/70, 29/72*
U.S. Cl. 315—389 **6 Claims**



1. A transformerless output vertical deflection circuit, comprising a vertical oscillator circuit for generating a vertical pulse train in response to vertical synchronizing pulses applied thereto, a sawtooth signal generator for generating a series of sawtooth signals, each cycle of said sawtooth signal including a pulse component, a vertical output circuit coupled to said sawtooth generator for amplifying said sawtooth signal including said pulse component and loading a vertical deflection coil, and stabilizing means connected between said vertical oscillator and said sawtooth signal generator for varying the width of the pulse component which is to be fed to said vertical output circuit in response to the average level of DC output voltage fed from the vertical output circuit.

3,953,766
GROUND FAULT CIRCUIT INTERRUPTER AND ELECTRONIC MODULE THEREFOR

Edward Keith Howell, Simsbury, Conn.; Donald Leland Watrous, Liverpool, and Robert George Hodgins, Canastota, both of N.Y., assignors to General Electric Company, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,272
Int. Cl.² H02H *3/26*
U.S. Cl. 317—18 D **24 Claims**

1. A ground fault circuit interrupting device for interrupting an AC power distribution circuit including line and neutral conductors in response to a ground fault on either conductor; said device comprising, in combination:

A. contacts for interrupting at least one side of the distribution circuit;

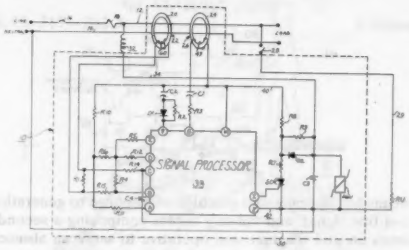
B. a solenoid energizable from the distribution circuit to initiate circuit interruption by said contacts;

C. a normally non-conductive switch connected in the solenoid energization circuit, said switch having a control input;

D. a differential current transformer responsive to a current imbalance in the line and neutral conductors signifying a ground fault for developing a fault signal of a magnitude proportional to the fault current; and

E. a signal processor for processing said fault signal, said processor including:

1. an amplifier for amplifying said fault signal,
2. a trip signal bus,
3. an integrating capacitor connected to said trip signal bus,
4. a plurality of threshold circuits connected in parallel to said trip signal bus and individually responsive to the amplified fault signal developed by said amplifier for establishing respectively increasing charging rates for



said integrating capacitor depending on the amplified fault signal amplitude, and

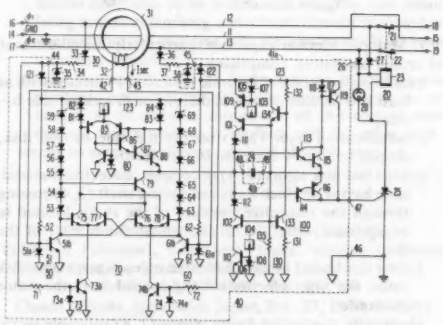
5. means connected to said trip signal bus and responsive to the voltage thereon developed by the charge accumulating on said integrating capacitor for generating a trigger signal input to render said switch conductive when said trip signal bus voltage reaches a predetermined level,
   a. whereby to actuate said solenoid and initiate circuit interruption by said contacts.

3,953,767

GROUND FAULT DETECTION APPARATUS

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 15, 1974, Ser. No. 461,268
Int. Cl.² H02H *3/28*
U.S. Cl. 317—18 D **8 Claims**



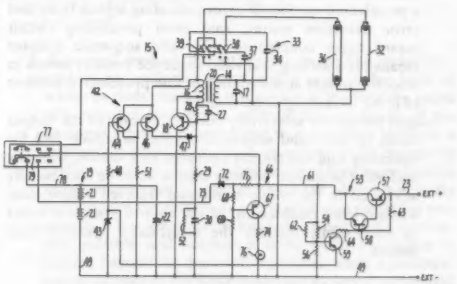
4. Ground-fault detection apparatus for determining the presence of a resistive ground-fault on one of a plurality of a-c power line conductors, said apparatus comprising:
   a differential transformer having a plurality of primary windings and a secondary winding, each of said primary windings receiving a current flowing through a respective one of the plurality of a-c power line conductors so that in the absence of a ground-fault in any of said power line conductors no a-c signal current will be induced in said secondary winding and during the occurrence of such ground fault an a-c signal current will be induced in said secondary winding;
   means responsive to the potential between a first pair of said a-c power line conductors for providing a first set of control pulses corresponding in timing with peaks of one polarity of that potential;
   means responsive to the potential between a second pair of said a-c power line conductors for providing a second set of control pulses corresponding in timing with peaks of one polarity of that potential;
   a first controlled-gain amplifier having an input circuit connected to said secondary winding, having an output circuit, and being connected to respond to the presence of control pulses in said first set to provide at its output circuit an amplified signal related to the a-c signal current received at its input circuit and to provide substantially no amplified signal during the intervals between those control pulses;
   a second controlled-gain amplifier having an input circuit connected to said secondary winding, having an output circuit, and being connected to respond to the presence of control pulses in said second set to provide at its output circuit an amplified signal related to the a-c signal current received at its input circuit and to provide substantially no amplified signal during the intervals between those control pulses;
   combining means for providing a combined signal responsive to the sum of the amplified signals respectively supplied thereto from the respective output circuits of said first and said second controlled-gain amplifiers; and
   means for determining whether or not the combined signal supplied thereto from said combining means has a direct component of an amplitude and duration indicative of the presence of a resistive ground fault.

3,953,768

PORTABLE FLUORESCENT LAMP AND INVERTER THEREFOR

Ronald D. Meredith, 25 Heather Place, Hillsborough, Calif. 94010 and John T. Shoberg, 1265 Fallen Leaf Drive, Milpitas, Calif. 93035

Division of Ser. No. 101,040, Dec. 23, 1970, abandoned. This application May 22, 1973, Ser. No. 362,669
Int. Cl. H02h *3/24*
U.S. Cl. 317—31 **7 Claims**

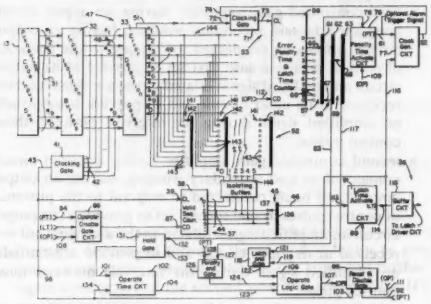


1. A portable fluorescent light, comprising a source of direct current,
   a high frequency inverter for converting said direct current to alternating current,
   a fluorescent lamp supplied with high frequency alternating current from said inverter,
   a ballast means connected to said fluorescent lamp and adapted to limit current flow thereto, and
   a voltage sensing circuit connected to said source of direct current and said inverter and operative to terminate current to said inverter at a preselected voltage level of said source of direct current indicative of a condition of said source of direct current at which further discharge would be damaging to said source of direct current.

3,953,769
ELECTRONIC SECURITY CONTROL SYSTEM

Riley M. Sopko, Glendale, Calif., assignor to Sargent & Greenleaf, Inc., Rochester, N.Y.

Filed July 29, 1974, Ser. No. 492,422
Int. Cl.² E05B 49/00
U.S. Cl. 317—134 22 Claims



1. In a security control system having an electrically operated lock means and code input means for selectively and sequentially energizing a plurality of input lines in accordance with a predetermined combination code, the combination therewith comprising:

valid sequence counter means having a plurality of output states and an input connected and responsive to the plurality of input lines for causing said counter means to successively assume each of its counting states in response thereto;

error detection means connected between said input lines and the output states of said valid sequence counter means for detecting the erroneous energization of one of said input lines not in conformance with the predetermined code and for disabling the control system in response thereto;

error processing circuit means coupled to the output of said error detection means including means for accumulating a preselected number of error indicating signals from said error detection means, said error processing circuit means being coupled to said valid sequence counter means for disabling said valid sequence counter means in response to said accumulation of said preselected number of error indicating signals; and

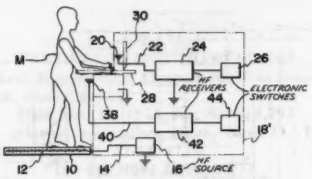
output means for selectively connecting one of the output states of said valid sequence counter means to and for operating said electrically operated lock means, whereby said valid sequence counter means must be successfully advanced to the above-mentioned selected output state without prior disablement of the control system in order to successfully operate the electrically operated lock means.

3,953,770
SAFETY EQUIPMENT FOR MACHINERY USED IN PROCESSING PLATES, ETC.

Jinnosuke Hayashi, No. 22-5, 2-chome, Nakai, Shinjuku, Tokyo, Japan

Filed Jan. 2, 1975, Ser. No. 538,119
Claims priority, application Japan, July 11, 1974, 49-78714; Oct. 3, 1974, 49-118791[U]; Nov. 27, 1974, 49-142737[U]
Int. Cl.² H01H 47/12
U.S. Cl. 317—146 4 Claims

1. A safety device for machinery, particularly machinery for processing plates and the like, comprising an insulating mat having an embedded electrically conductive grid and being adapted to carry an operator who is in working position adjacent to the machine; safety means for stopping the machine in the event part of the operator's body approaches a dangerous area of the machine, comprising a first source of high-frequency electrical energy connected to said grid so that a high-frequency field is formed about the body of the operator on said mat, a first antenna on said machine and positioned to sense said field when part of the operator's body approaches said dangerous area and to generate a first signal, and first

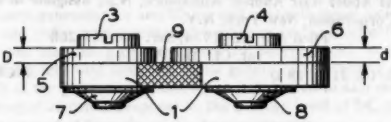


means for stopping said machine in response to generation of said first signal: and fail-safe means comprising a second antenna on said machine and operative to sense an absence of said field about the operator's body and in response to generate a second signal, and second means for stopping said machine in response to generation of said second signal.

3,953,771
MULTIPLE TRIMMER CAPACITOR, PARTICULARLY FOR ADJUSTMENT OF CRYSTAL OSCILLATORS

Manfred Bremstahler, Ruckersdorf, Germany, assignor to Firma Stettner & Co., Lauf, Pegnitz, Germany

Filed Oct. 9, 1974, Ser. No. 513,229
Claims priority, application Germany, May 21, 1974, 2424559
Int. Cl.² H01G 5/06
U.S. Cl. 317—248 15 Claims



1. Multiple trimmer capacitor, particularly for adjustment of crystal oscillators, comprising

a stator support disk of ceramic material (1) formed with at least two parallel apertures therethrough located side-by-side;

a metallization layer (2,2') on the top side of said disk, shaped to form a common stator electrode;

at least two disk rotors (5, 6) of ceramic, dielectric material, each having an electrically conductive shaft (3, 4) passing through the respective aperture of the stator located in engagement with, and on the metallization layer of the disk;

a rotor electrode (14), each located on each respective disk rotor, the rotor electrode being spaced from the stator electrode;

electrically conductive spring means (7, 8) rotatably securing the shaft, and hence the disk rotors to the support disk (1);

and a conductive coating (9, 9a, 9b) at the bottom side of said support disk (1) forming an electrical connection to the spring means and hence to the shafts to provide at least one terminal for the rotors, each individual rotor electrode and the common stator electrode forming a trimmer capacitor unit;

wherein one rotor disk has a larger diameter than the other to provide rotors of different capacitative characteristics with respect to the common stator electrode (2) to provide different maximum and minimum capacitances and to provide one capacitor unit for fine, and the other

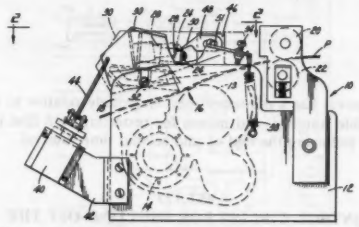
capacitor unit for coarse adjustment on the common support disk (1).

3,953,772

CLEANING OF CORONA ELECTRODES

Robert E. Zimmer, Niles, Ill., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 25, 1974, Ser. No. 454,232
Int. Cl.² H01T 19/00
U.S. Cl. 317—262 A 5 Claims



1. A copying machine including means for applying electroscopic toner powder to the surfaces of members having electrostatic images thereon, comprising:

a corona electrode element in the form of a fine gauge, tightly stretched wire for generating a bias in the vicinity of the toner powder application site;

means for energizing said electrode to generate a corona discharge for the aforesaid purpose;

means for stimulating the wire electrode element into a state of controlled vibration of sufficient amplitude to free it of toner powder accumulated on the wire surface without subjecting the fine gauge wire to mechanical effects dangerous to its mechanical integrity, said stimulating means comprising a plectrum element mounted on the machine and coacting with the wire to pluck the same to initiate vibration;

a movable support on said frame for one of said corona electrode element and said plectrum element, so arranged as to provide movement of the one element through a path wherein it conflicts with the other; and

means to mechanically actuate said movable support.

3,953,773

ANTI-LOCK BRAKE CONTROL CIRCUIT

Yukitsugu Fukumori, Yokohama, Japan, assignor to Nissan Motor Company Limited, Yokohama, Japan

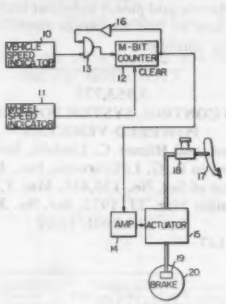
Filed Dec. 11, 1974, Ser. No. 531,729
Claims priority, application Japan, Dec. 27, 1973, 49-1291
Int. Cl.² B60T 8/08
U.S. Cl. 318—52 14 Claims

1. An anti-lock brake control circuit for a vehicle having a plurality of braked wheels comprising:

first means for sensing speed of the vehicle relative to ground and producing first pulses at a first variable rate indicating the vehicle speed;

second means for sensing speed of the wheels and producing second pulses at a second variable rate lower than said first rate indicating the wheel speed;

third means connected to said first means for counting the number of said first pulses and producing a brake release signal for releasing the brake applied to said wheels when the count therein reaches a predetermined number and further coupled to said second means such that said count is cleared by one of said second pulses; and



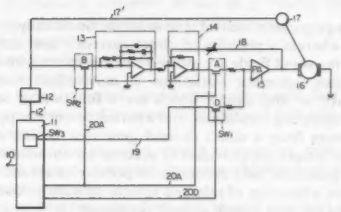
fourth means for maintaining said brake release signal until said second pulse clears said count.

3,953,774

CONTROL METHOD OF A DC MOTOR

Tadasu Sato, Tachikawa, and Chuichi Yoshitake, Tokyo, both of Japan, assignors to Fujitsu Ltd., Japan

Filed Nov. 30, 1973, Ser. No. 420,648
Int. Cl.² G05B 11/18
U.S. Cl. 318—594 5 Claims



1. A control method of a DC motor or the like including:

providing an analogue signal and a scale pulse both of whose periods change in proportion to the rotating speed of a rotor of said motor, wherein the amplitude of the analogue signal is proportional to a deviation between a destination position at which an object to be moved by said motor during every predetermined feeding interval is to be stopped and a position where the object is actually located, and the amplitude of the analogue signal has one polarity when the object is located in front of the destination position and another polarity when the object is located beyond the destination position, while a predetermined number of the scale pulses are included within said predetermined feeding interval;

providing a program curve which contains said intervals with which said object is supplied close to the destination position, and also contains time intervals and as a result of the comparison of the period of the scale pulse and said time intervals the object is moved to the desired position at a predetermined acceleration rate, running speed and deceleration rate;

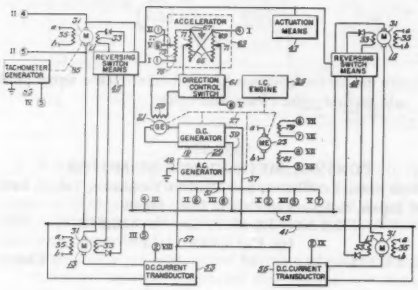
moving said object by means of said motor which is driven by a power amplifier under control of pulse-width modulated pulses until said object comes close to the destination position, wherein the pulse-width modulated pulses are produced according to the deviation which is detected by comparing said time interval and the period of said scale pulse, and;

moving the object by means of said motor which is driven by said power amplifier under control of said analogue signal when the object comes closer to the destination position, wherein said power amplifier includes a negative feed-back loop so that the power amplifier may act as a linear power amplifier.

3,953,775
PROPULSION CONTROL SYSTEM FOR ELECTRICALLY POWERED VEHICLES

Aaron D. Friend, and Hilmer C. Lindahl, both of Longview, Tex., assignors to R. G. LeTourneau, Inc., Longview, Tex.

Continuation of Ser. No. 139,451, May 3, 1971. This application Mar. 23, 1973, Ser. No. 344,080
Int. Cl.[2] B60L *11/02*
U.S. Cl. 318—147 **4 Claims**



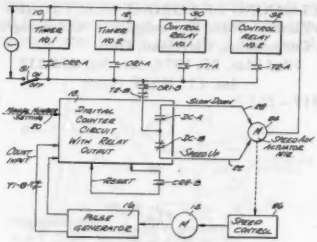
1. In a propulsion control system for an electrically powered vehicle wherein a plurality of direct current wheel drive motors having shunt fields are utilized and means are provided to accomplish automatic variations in motor field excitation responsive to first signals which are a function of selected vehicle operating conditions, and wherein power is supplied to said motors from a direct current generator having a shunt field and means are provided to accomplish automatic variations in generator field excitation responsive to second signals which are a function of selected vehicle operating conditions, and wherein said direct current generator is driven by an internal combustion engine which also drives an AC generator; the improvement wherein said first signals comprise one or more "increase" functions and one or more "diminish" functions and means are provided to effect priority for the diminish functions, and said second signals comprise a signal responsive to a condition requiring quick reduction or reversal of generator field excitation which may include a signal responsive to engine under speed.

3,953,776
DIGITAL MOTOR SPEED CONTROL CIRCUIT

Robert F. Wolf, Waukesha, Wis., assignor to Waukesha Foundry Company, Inc., Waukesha, Wis.

Continuation-in-part of Ser. No. 425,013, Dec. 14, 1973. This application Dec. 16, 1974, Ser. No. 527,573
Int. Cl.[2] H02P *5/06*
U.S. Cl. 318—312 **13 Claims**

1. A speed control circuit comprising a rotatable shaft, a pulse generator coupled to the shaft for generating electrical pulses at a frequency that is proportional to the rotary speed of the shaft, pulse counter means having at least one presettable number associated therewith and having means for indicating the relative magnitude of the count attained by said counter and each said presettable number, means for gating the output of said pulse generator into said counter means during a first fixed time interval which is long compared to the rotational period of said shaft, and means for varying the speed of said shaft in a predetermined direction during a second fixed time interval which follows said first time interval if the count attained by said counter in the preceeding first

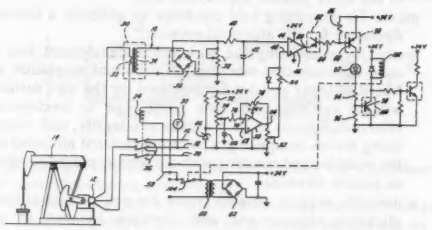


time interval has a predetermined magnitude relative to said presettable number, and means for restarting said first time interval following the end of said second time interval.

3,953,777
CONTROL CIRCUIT FOR SHUTTING OFF THE ELECTRICAL POWER TO A LIQUID WELL PUMP

Fount E. McKee, Houston, Tex., assignor to Delta-X Corporation, Houston, Tex.

Filed Feb. 12, 1973, Ser. No. 331,804
Int. Cl.[2] H02P *1/04*
U.S. Cl. 318—474 **5 Claims**



1. A circuit for shutting off the electrical power to the drive motor of a liquid well pump comprising,

means for sensing the instantaneous current to the motor,

an RC circuit connected to and receiving the output from the sensing means, the RC circuit having a time constant greater than the time required for the pump to complete one full pumping cycle and the impedance of the charging path and the impedance of the discharging path of the condenser in the RC circuit being substantially the same whereby the RC circuit senses the average current drawn by the motor,

a comparator connected to the RC circuit,

a reference voltage connected to the comparator, said reference voltage is obtained from an amplifier connected to the electrical power, and in which the output of the amplifier varies inversely to variations of voltage of the electrical power, and

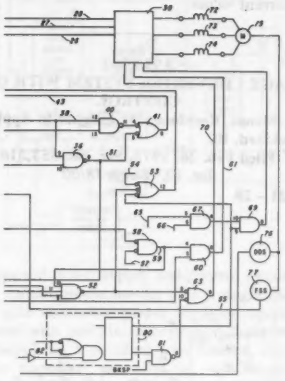
switching means connected to the output of the comparator and to the electrical power to the motor, said switching means actuated by the comparator when the average current to the motor decreases to a predetermined amount for shutting off power to the motor.

3,953,778

MOTION CONTROL SYSTEM FOR AN INDUCTIVELY CONTROLLED MULTI-PHASE MOTOR

William Edward Bray, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 1, 1974, Ser. No. 456,496
Int. Cl.² G05B 19/40
U.S. Cl. 318—685 28 Claims



1. An electro-mechanical motion control system having at least one inductively controlled multi-phase motor with at least one coil corresponding to each phase, for providing desired mechanical motion, comprising:

a. drive circuit means, for providing current of a desired waveform and amplitude to the multi-phase motor;

b. position sensing means for providing an electrical signal indicative of the angular position of the multi-phase motor;

c. selecting means for selecting at least one phase of the multiphase motor and electrically connecting the corresponding motor coil to the drive circuit means to cause the motor to rotate either in the forward or reverse direction;

d. dynamic braking means connected to receive and responsive to the indicia signal and connected to the selecting means to cause the selecting means to select at least one phase that lags the previously selected phase and to electrically connect the corresponding motor coil to the drive circuit means for a prescribed period of time, thereby providing the motor with the required retrotorque;

e. reference voltage means for providing a reference voltage;

f. input voltage means connected to receive and responsive to the indicia signal for providing a reference voltage; and

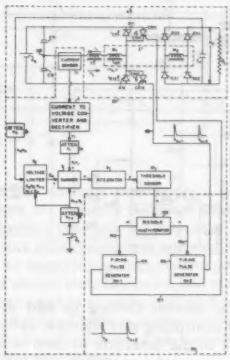
g. comparison means operatively connected to the reference voltage means and the input voltage means, and having an output connected to the dynamic braking means and connected to the selecting means and to the drive circuit means, for comparing the reference voltage to the input voltage and providing a first output signal of a first predetermined value when the voltages are of a first prescribed range of differences and for providing a second predetermined value when the voltages are of a second range of differences, the first output signal causing the drive circuit means and the dynamic means to operate.

3,953,779

ELECTRONIC CONTROL SYSTEM FOR EFFICIENT TRANSFER OF POWER THROUGH RESONANT CIRCUITS

Francisc Carol Schwarz, 18339 Timber Lane, Fairview Park, Ohio 44126

Filed May 30, 1974, Ser. No. 474,788
Int. Cl.² H02M 3/315
U.S. Cl. 321—2 16 Claims



1. A controllable converter device for providing electrical current to a load, comprising in combination:

a power source;

first and second switch means;

capacitor means;

a first series resonant circuit comprising said first switch means connected in series with the load and said capacitor means;

a second series resonant circuit comprising said second switch means connected in series with the load and said capacitor means;

means connecting said first and second resonant circuits across said power source;

control means enabling alternate conduction of said first and second switch means to provide alternate direction load current from said power source to the load during alternate charging of said capacitor means;

said alternate charging of said capacitor means providing alternate potentials which oppose said alternate conduction of said first and second switch means thereby alternately terminating conduction of said first and second switch means;

and means connected to said first and second series resonant circuit for enabling discharge of said capacitor means between said alternate direction load currents to limit the voltage of said capacitor means.

3,953,780

INVERTER HAVING FORCED TURN-OFF

Thomas E. Anderson, Normal, Ill., and John P. Walden, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,772
Int. Cl.² H02M 7/00
U.S. Cl. 321—18 20 Claims

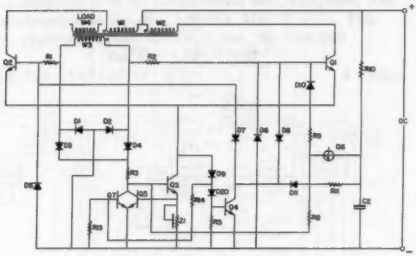
1. An electrical inverter circuit for converting a d.c. electrical input into an a.c. electrical output, said inverter circuit comprising:

a transformer structure having secondary winding means for supplying said electrical output and a primary winding

means, said winding means being magnetically coupled to each other through magnetic circuit means,

active element switch means electrically connected to said primary winding means and electrically connectable to said d.c. electrical input for alternately switching said d.c. electrical input to said primary winding means for producing corresponding varying magnetic fields in said magnetic circuit means and thereby producing said a.c. electrical output in said secondary winding means, and

electrical control means electrically connected to said active element switch means for monitoring the magnitude



of electrical current flowing in said primary winding means and controlling said alternate switching operation in response to the detection of current in said primary winding in excess of a predetermined level,

said electrical control means including a further controllable active element means in circuit with said active element switch means such that the primary winding current also flows therethrough and synchronous control means for synchronously controlling said further active element means so as to increase the electrical impedance thereof during at least a portion of each switching transition of said active element switch means.

3,953,781

CONTROLLABLE AND QUENCHABLE RECTIFIER CIRCUIT FOR HIGH DIRECT CURRENT VALUES

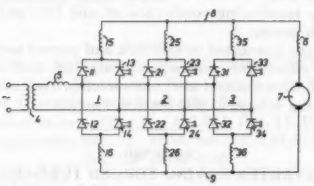
Johannes Forster, and Karl-Heinz Bezold, both of Berlin, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 11, 1974, Ser. No. 531,799

Claims priority, application Germany, Dec. 12, 1973, 2362375

Int. Cl.² H02M 7/00

U.S. Cl. 321—27 R **6 Claims**



1. In a rectifier circuit for alternating current including a rectifying bridge circuit having a plurality of controllable rectifier elements, a separate quenching means for each of said controllable rectifier elements for reducing feedback to the main, first means for connecting the input of said bridge circuit to an alternating current main, a pair of bus bars for connection to a load, and second means for connecting each of the output terminals of said bridge circuit to a respective one of said pair of bus bars, the improvement wherein: said rectifier circuit includes a plurality of said rectifying bridge circuits with each of the controllable rectifier elements of each of said bridge circuits having a separate quenching means associated therewith; said first means connects the inputs of all of said bridge circuits in parallel to the alternating current main in a rigid and low impedance manner, said second means includes a separate impedance connected between each of said output terminals and the associated one of said bus bars; and further comprising means for controlling said quenching means to quench the associated controllable rectifier elements of the respective bridge circuits in a stepped sequence, whereby the rectifier circuit may be utilized for high d.c. current values.

3,953,782

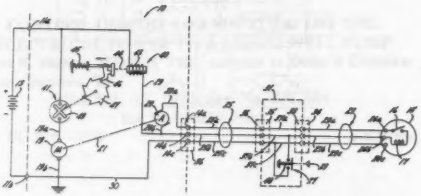
VOLTAGE CONVERTER SYSTEM WITH ON-OFF CONTROL

William A. Means, Rockford, Ill., assignor to Applied Motors, Inc., Rockford, Ill.

Filed Feb. 26, 1975, Ser. No. 553,314

Int. Cl.² B60R 18/00

U.S. Cl. 321—28 **6 Claims**



1. A voltage converter system having:

a input terminals adapted for connection to a battery, output terminals adapted for connection to an electrical load device rated for operation from an ac. voltage, and a ground terminal adapted for connection to the grounding terminal of the load device;

b a motor-alternator set including:

b1 a dc. motor having input leads connected to said input terminals and rated for energization from the voltage of said battery, and

b2 an alternator having output leads connected to said output terminals and rated to produce an ac. voltage corresponding substantially to the rated operating voltage of said output device;

c a normally open switch connected in a first series path which includes said input terminals, said ground terminal, and one of said output terminals, said switch being rendered conductive when manually actuated and being operable when conductive to cause current to flow through said first series path from said battery when the latter is connected to said input terminals;

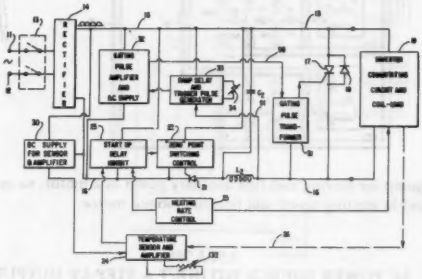
d a switching means connected in a second series path with said input leads and said input terminals; and

e means in said first series path and responsive to current flow resulting from manual actuation of said switch to render said switching means conductive when said switch is first manually actuated and to render said switching means non-conductive when said switch is next manually actuated, said switching means being operable when conductive to cause current to flow through said second series path from said battery when the latter is connected to said input terminals, whereby successive manual actuations of said switch cause said motor to be successively energized and de-energized.

3,953,783
LOW CAST CHOPPER INVERTER POWER SUPPLY AND GATING CIRCUIT THEREFOR

Philip H. Peters, Jr., Greenwich, N.Y., assignor to Environment/One Corporation, Schenectady, N.Y.

Division of Ser. No. 261,227, June 9, 1972, which is a division of Ser. No. 131,648, April 6, 1971, Pat. No. 3,710,062. This application Mar. 26, 1974, Ser. No. 454,787
Int. Cl.² H02M *7/515*
U.S. Cl. 321—43 **69 Claims**



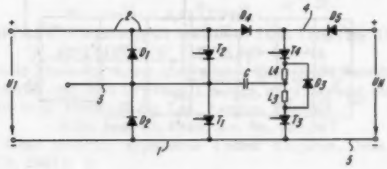
1. An improved power supply and control circuit comprising inverter circuit means having only a single bidirectional conducting gate controlled power thyristor coupled to and supplying load with periodic energization currents, rectifier means for supplying a rectified semi-filtered unidirectional high voltage excitation potential for said inverter circuit means and gating circuit means for periodically gating on said inverter circuit means, said gating circuit means including means for deriving a low voltage unidirectional self excitation potential from the high voltage rectified unfiltered unidirectional excitation potential supplied from said rectifier means, timing circuit charging means supplied by said low voltage excitation potential, voltage responsive switching means connected to and controlled by said timing circuit charging means, said voltage responsive switching means being rendered conductive upon the voltage of said timing circuit charging means attaining a preset value, a semiconductor switching device having a relatively flat current vs voltage conducting characteristic and having its load terminals connected to the output from the rectifier means, the control gate of said constant current semiconductor switching device being connected to and supplied by the voltage responsive switching means and gating signal output circuit means connected in series circuit relationship with the constant current high voltage switching device and adapted for connection to the control gate of the gate controlled power thyristor comprising a part of the invertor circuit means.

3,953,784
THYRISTOR CIRCUIT FOR CONVERSION OF DIRECT CURRENT TO ALTERNATING CURRENT

Heinrich Kummeke, Zorneding near Munich, Germany, assignor to Wacker Werke KG, Munich, Germany

Filed Feb. 26, 1975, Ser. No. 553,257
Claims priority, application Germany, Feb. 27, 1974, 2409418; Jan. 17, 1975, 2501767
Int. Cl.² H02M *7/505*
U.S. Cl. 321—45 C **11 Claims**

1. In a thyristor load inverter circuit; a first DC-supply conductor at a fixed potential, a second supply conductor at a potential relative to the potential of the first supply conductor and variable between a predetermined minimum value near the potential of the first DC-supply conductor and a predetermined maximum value, an AC-output conductor, a first main thyristor connected between said AC-output conductor and said first supply conductor and poled toward the latter, a second main thyristor connected between said AC-output conductor and said second supply conductor and poled toward the former, a first auxiliary conductor connected to a source of auxiliary positive voltage having a value always essentially higher than the potential of the first DC-supply conductor, a second auxiliary conductor negative relative to said first auxiliary conductor and having a potential corresponding essentially to that of the first DC-supply conductor, a commutation branch having one end connected to said first auxiliary conductor and the other end connected to said second auxiliary conductor and comprising in series from said

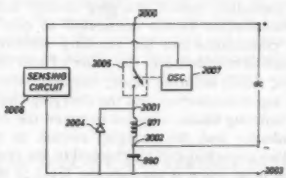


first to said second auxiliary conductors a first and second auxiliary thyristor, the auxiliary thyristors being poled toward said second auxiliary conductor, a capacitor connected between the juncture of said inductors and said AC-output conductor, means for supplying igniting control pulses alternately to said first and second main thyristors, and means for supplying igniting control pulses to said auxiliary thyristors in timed relation to the supply of igniting control pulses to said main thyristors to effect extinguishing of each main thyristor prior to ignition of the other thereof.

3,953,785
POWER SUPPLY

William Sherman Bell, Jr., Houston, Tex., assignor to Telxon Corporation, Houston, Tex.

Filed Nov. 29, 1974, Ser. No. 528,439
Int. Cl.² H02M *7/44*
U.S. Cl. 321—43 **2 Claims**



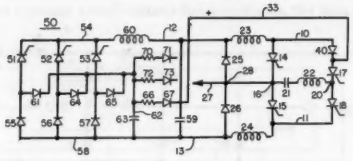
1. A power supply comprising:
a. first, second, third and output contact points;
b. a d-c voltage source connected between the first and third points;
c. an inductance connected between the second and third points;
d. a capacitor connected between the third and output points;
e. a diode connected between the second and output points, for providing a current conduction path through the inductance and the capacitor;
f. a switch connected between the first and second points,
g. an oscillator for periodically closing said switch, said oscillator having a predetermined period and duty cycle; and
h. a sensing circuit connected between the first and output points, for inhibiting the oscillator when the voltage at the output point exceeds a predetermined value.

3,953,786

EXTERNAL CHARGING CIRCUIT FOR STATIC SWITCH

Hsiao J. Ma, Des Plaines, and George H. Studtmann, Mount Prospect, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 29, 1971, Ser. No. 128,752
Int. Cl.² H02M 7/515
U.S. Cl. 321—45 C **3 Claims**



1. In a switching circuit including a pair of reference conductors for receiving a main energizing voltage from a pair of d-c input conductors, a pair of main semiconductor switches connected in series between the reference conductors with no other component between the main semiconductor switches, a pair of auxiliary semiconductor switches coupled in series between the reference conductors, a first pair of diodes coupled in series between the d-c input conductors and connected in a sense opposite the connection of the main and auxiliary semiconductor switches, with the common connection between the diodes being coupled to the common connection between the main semiconductor switches, and a series circuit including an inductor and a commutating capacitor coupled between the common connection between the main semiconductor switches and the common connection between the auxiliary semiconductor switches, the improvement which comprises

a pair of auxiliary conductors connected to receive energy over a path which is independent of the main energizing voltage and to complete a charging circuit with the commutating capacitor, which charging circuit includes a main semiconductor switch connected to one of said reference conductors and the auxiliary semiconductor switch which is connected to the other of said reference conductors, a first isolating diode, coupled between one of the d-c input conductors and the charging circuit, and a second isolating diode, coupled between the other d-c input conductor and the charging circuit, so that the commutating capacitor can be charged to the commutating voltage level when it exceeds the level of the main energizing voltage present on the d-c input conductors.

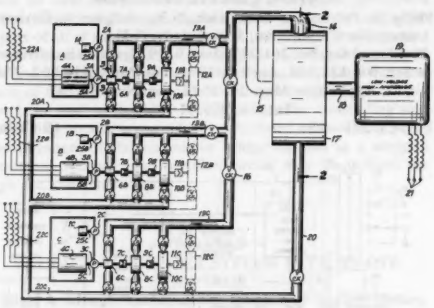
3,953,787

DRIVE SYSTEM

Edward Helbling, 393 E. 5th St., Brooklyn, N.Y. 11230

Continuation-in-part of Ser. No. 448,929, March 7, 1974, abandoned. This application Oct. 24, 1974, Ser. No. 517,840
Int. Cl.² H02P 9/00
U.S. Cl. 322—13 **4 Claims**

1. A drive system, comprising drive means including a motor adapted to be driven from a source of high-voltage energy; driven means including a generator adapted to produce lower-voltage electric energy; intermediate means powered by said drive means and operative for driving said driven means, including at least one closed hydraulic circuit including a circuit loop, a plurality of hydraulic pumps of successively greater capacity which are driven by said motor, and a fluid driven rotor coupled to said generator driving the same and receiving the combined fluid output of said hydraulic pumps; and an auxiliary hydraulic loop, a first auxiliary hydraulic pump in said auxiliary loop and coupled with a drive shaft of said motor, and an auxiliary motor and a second auxiliary



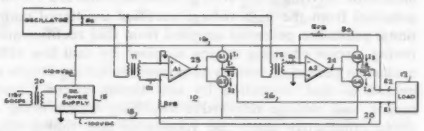
pump for driving said first auxiliary pump as a motor, so as to aid in starting-up of said first mentioned motor.

3,953,788

AC POWER SOURCE WITHOUT A STEP-UP OUTPUT TRANSFORMER

Fausto V. Taddeo, and Raymond W. Pauly, both of San Gabriel, Calif., assignors to Pacific Electronic Enterprises, Inc., Rosemead, Calif.

Filed Apr. 14, 1975, Ser. No. 568,017
Int. Cl.² G05F 1/44
U.S. Cl. 323—25 **14 Claims**



1. An alternating current (AC) power source for supplying AC power to a load at a selected voltage rating up to a selected current rating, the power source comprising:

first and second output terminals across which said load is to be connected;

first means including first voltage means and first current-amplifying means connected between said first voltage means and said first output terminal for providing at said first output terminal AC power at a voltage which is half said selected voltage rating up to said selected current rating, said first means including first feedback means for providing directly a feedback signal from said first output terminal to said first voltage means;

second means including second voltage means and second current amplifying means connected between said second voltage means and said second output terminal for providing at said second output terminal AC power at a voltage which is half said selected voltage rating, and which is 180° out of phase with respect to the voltage at said first output terminal, and up to said selected current rating, said second means including second feedback means for providing directly a feedback signal from said second output terminal to said second voltage means;

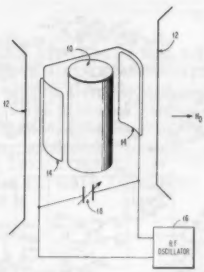
each of said first and second current amplifying means including a plurality of parallel connected common base driven current amplifying transistors; and

protective means included in at least one of said current amplifying means for protecting the parallel connected transistors from a short failure in one of said parallel connected transistors.

3,953,789
METHOD OF POLARIZING NUCLEI

Wiebren Sjoerd Veeman, Grave, Netherlands, and Costantino Sheldon Yannoni, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 20, 1974, Ser. No. 525,326
Int. Cl.² G01R 33/08
U.S. Cl. 324—.5 AC 8 Claims



1. A method for polarizing first nuclei having a long relaxation time in a solid in a high DC magnetic field where said solid contains first nuclei having long relaxation times and second nuclei having short relaxation times comprising the steps of

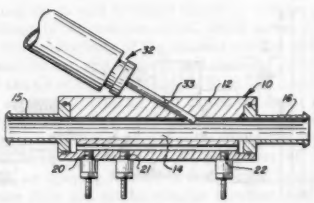
applying a DC magnetic field having a strength above 1000 gauss to said solid, and

sweeping said solid with a radio frequency field sufficient to excite a significant number of said second nuclei for a time which is at least as long as the time required to polarize said first nuclei.

3,953,790
CONDUCTIVITY MONITORING SYSTEM

Wendell V. Ebling, Libertyville, Ill., and Herbert Goldsmith, Rockville, Md., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 519,729, Oct. 31, 1974, abandoned. This application Feb. 5, 1975, Ser. No. 547,320
Int. Cl.² G01R 31/32
U.S. Cl. 324—30 B 15 Claims



1. A conductivity monitoring system for continuously monitoring the conductivity of a fluid flowing into and through a housing comprising:

a. indicator means

b. at least a common, a first and a second electrode disposed within said housing in contact with said fluid, said common electrode being positioned closer to said first electrode than to said second electrode, whereby the electrical conductivity between said common electrode and said first electrode will be different than the electrical conductivity between said common electrode and said second electrode;

c. means connected to said electrodes to approximate a constant current source for energizing said electrodes to provide substantially the same current flow through them.

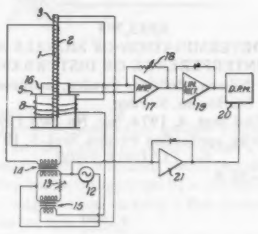
d. means for detecting the difference in the conductivity between said common and first electrodes and between said common and second electrodes and providing a difference voltage output signal representing the value of the conductivity of said fluid; and

e. means for coupling said signal to said indicator means to operate said indicator means.

3,953,791
APPARATUS FOR AND METHOD FOR TESTING THE NUMBER OF TURNS ON A COIL

Ronald Frederick Spurr, Sevenoaks; Colin Alan Boardman, Shirley, and John D. Yewen, Croydon, all of England, assignors to H. Tinsley & Co. Ltd., London, England

Filed June 14, 1974, Ser. No. 479,567
Claims priority, application United Kingdom, June 19, 1973, 29011/73
Int. Cl.² G01R 33/00
U.S. Cl. 324—34 R 20 Claims



1. Apparatus for testing the number of turns on a coil comprising a rod capable of being magnetically energized, an energizing coil wound on the rod and connected to magnetically energize the rod to generate flux, at least two compensating coil means coaxially spaced axially along the rod and adapted to be energized to modify the flux in the sense to provide between the compensating coil means and about the rod a space in which the flux is substantially uniform, and support means about the rod for supporting within said space a coil to be tested.

3,953,792
PARTICULATE AND AEROSOL DETECTOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Jimmie J. Wortman, Chapel Hill, N.C.; Robert P. Donovan, Durham, N.C.; Arthur D. Brooks, Morrisville, N.C.; Larry K. Monteith, Raleigh, N.C.; William H. Kinard, Williamsburg, and Robert L. O'Neil, Yorktown, both of Va.

Filed Apr. 26, 1974, Ser. No. 464,722
Int. Cl.² G01R 27/26
U.S. Cl. 324—61 R 8 Claims

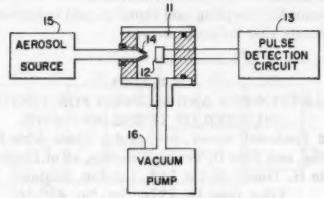
1. A device for measuring aerosol particles suspended in a gas comprising:

a capacitor including a first conducting layer, a dielectric layer less than 2,000 angstroms thick grown on said first conducting layer, and a second conducting layer less than 1,000 angstroms thick evaporated onto said dielectric layer;

a circuit means connected to said two conducting layers of said capacitor for charging said capacitor;

an accelerator means for accelerating said gas to a velocity such that each of said aerosol particles will penetrate both said second conducting and said dielectric layers of said capacitor, said accelerator means being positioned such

that said accelerated gas is directed onto said second conducting layer whereby each aerosol particle will short said two conducting layers of said capacitor thereby causing the capacitor to discharge until the conducting path is vaporized causing the capacitor to recharge to its initial level; and



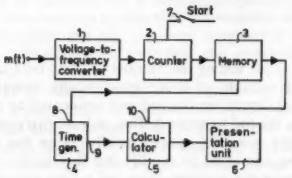
detection means connected to said circuit means for counting the number of discharges of said capacitor whereby the density of said aerosol particles in said gas is determined.

3,953,793

OPTIMAL DETERMINATION OF SIGNALS AFFECTED BY INTERFERENCE OR DISTURBANCE

Bruno Yngve Nilsson, Boliden, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Filed Sept. 4, 1974, Ser. No. 503,179
Claims priority, application Sweden, Sept. 5, 1973, 7312088
Int. Cl.² G01R *19/00*
U.S. Cl. 324—76 A **2 Claims**



1. A method of determinine a true signal in the presence of an interfering signal, said true and interfering signals combining to form a measuring signal, comprising the steps of:

continuously integrating said measuring signal to provide a plurality of integrated values,

generating a plurality of time signals measured from the beginning of said continuous integration,

dividing the integrated values corresponding to each of said plurality of time signals by the corresponding time signal to obtain a plurality of quotient signals, and

presenting said quotient signals, said quotient signals fluctuating in value near the beginning of said integration and becomming substantially constant as said integration continues and the influence of said interfering signal is reduced.

3,953,794

DIGITAL PHASE DETECTOR

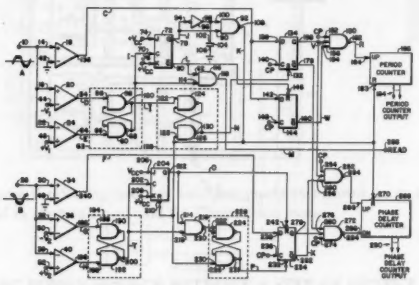
Phillip M. Moore, Phoenix, Ariz., assignor to Motorola Inc., Chicago, Ill.

Filed Mar. 27, 1975, Ser. No. 562,694
Int. Cl.² G01R *25/00*
U.S. Cl. 324—83 D **7 Claims**

1. An apparatus for providing an indication of a phase angle relationship of a first and a second noisy signal; the first and second signals having the same period, each signal having a spectrum consisting only of odd harmonics of a sine wave having the same period, and each signal having a finite slope at each zero crossing time; comprising:

means for amplifying and limiting the first and second noisy signals to provide first and second bilevel signals, respectively, said bilevel signals being noisy in the time vicinity of the zero crossing times;

means for providing clock pulses of a predetermined repetition rate;



first and second counter means; and

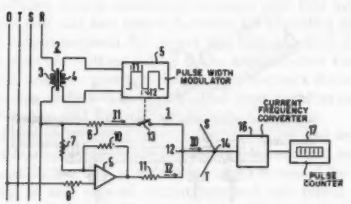
logic means for enabling said first counter means to count and store a first number of clock pulses proportional to the period time of said first noisy signal, for enabling said second counter means to count and store a second number of clock pulses proportional to the phase delay time between said first and said second noise signals and for providing an output signal indicative of the completion of said counts.

3,953,795

TRANSFORMERLESS KILOWATTHOUR METER FOR AN ELECTRICAL POWER LINE

Julius Brunner, Ruckersdorf; Manfred Schwendtner, Schwarzenbruck, and Günter Steinmuller, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 26, 1974, Ser. No. 509,681
Claims priority, application Germany, Sept. 27, 1973, 2348667
Int. Cl.² G01R *7/00, 11/32*
U.S. Cl. 324—142 **12 Claims**



1. An apparatus for measuring kilowatthours in an electrical power line, comprising:

a pulse width-frequency modulator, coupled to said line and controlled by the load current thereof;

transformerless first means, coupled to said line, for generating a first current which is proportional to the load voltage of said line;

transformerless second means, including inverting amplifying means, coupled in parallel relationship to said transformerless first means, for generating a second current which is opposite in polarity to said first current and is

proportional to one half the instantaneous value of said first current; and

switching means, controlled by said modulator, and coupled in series relationship to said transformerless first means, for adding said first current to said second current in one of two switching conditions, the average value of the sum of said first and second currents being proportional to the product of the load current and the load voltage of said power line.

3,953,796

METHOD AND APPARATUS FOR MEASURING ELECTRICAL CONDUCTIVITY

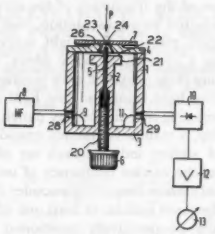
Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 30, 1974, Ser. No. 474,612

Claims priority, application Germany, June 5, 1973, 2328590; June 5, 1973, 2328589

Int. Cl.² G01R 31/26, 27/02

U.S. Cl. 324—158 R 8 Claims



1. An arrangement for measuring of the local variation of the electrical conductivity of a semiconductor planar member such as a silicon disc without destroying it comprising, a resonant circuit, a high frequency generator connected to excite said resonant circuit, a portion of the area of the semiconductor member which is to be measured capacitively coupled to said resonant circuit so as to attenuate the energy in the resonant circuit as a function of its resistivity, a voltage measuring device coupled to said resonant circuit to measure the resonance voltage of the resonant circuit which serves as measurement of the conductivity of the coupled portion of the area of the semiconductor, and wherein said resonant circuit consists of a tank circuit of high quality in the form of a coaxial resonator with an inner conductor and closed off outer conductor and whereby said inner conductor has one end electrically connected to a first cover of said outer conductor and its other end capacitively coupled to a second cover of said outer conductor, an opening formed in said second cover having a smaller size than said semiconductor member, said semiconductor member mounted on said second cover over said opening and coupled to said resonant circuit through said opening formed in said second cover and said semiconductor member pressure supported over said opening, and a coaxial probe mounted in said inner conductor of said resonant circuit with one end which extends from said other end of said inner conductor to capacitively couple said other end of the inner conductor and said one end of said probe to said semiconductor member and said probe is shiftable axially of said inner conductor and relative to said opening in said second cover, whereby the capacitive coupling of said resonant circuit with the coupled area of said semiconductor member can be adjusted.

3,953,797

ELECTRONIC EQUIPMENT ASSEMBLY COMPRISING PLUG-IN MODULES AND TEST BARS

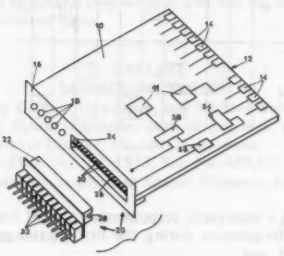
Yves Bally Berard, La Tronche; Paul Claudin, and Claude Leymarie, both of Grenoble, all of France, assignors to Merlin Gerin, Grenoble, France

Filed Nov. 13, 1973, Ser. No. 415,408

Claims priority, application France, Nov. 20, 1972, 72.41212

Int. Cl.² G01R 31/02, 31/26

U.S. Cl. 324—158 F 5 Claims



1. An assembly comprising

a plug-in electronic equipment module having a first edge portion carrying a plurality of normal-service contacts for engagement in plug-in relation with a plurality of registering mating contacts supported by a connector panel, and a second edge portion carrying a first plurality of aligned test contacts, and

a test fixture comprising a test bar having a second plurality of aligned test contacts, said second plurality of test contacts mating with and being in registration with said first plurality of test contacts; a plurality of switches each having a bridging contact, one of said switches being associated with each of said second plurality of test contacts; a plurality of sets of conductive tabs, one of said sets of tabs being associated with each of said second plurality of test contacts and having a first group electrically connected to the corresponding test contact and a second group for connection to an external voltage source, the bridging contact on the associated switch being movable to electrically connect selected tabs of said first and second groups, said test fixture permitting the testing of the operation of said module in its plug-in position.

3,953,798

METHOD AND DEVICE FOR RADIO TRANSMISSION OF BINARY DATA SIGNALS

Jan Roland Sjostrand, and Lars Henning Zetterberg, both of Jarfalla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 7, 1974, Ser. No. 521,928

Claims priority, application Sweden, Nov. 9, 1973, 7315253

Int. Cl.² H02B 1/00

U.S. Cl. 325—30 5 Claims

1. A method of transmitting and receiving binary data signals using different signal frequencies to represent the 1 and 0 bits of said binary data signals, comprising the steps of

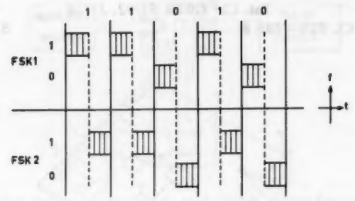
transmitting each bit of said binary data signal periodically during bit intervals,

transmitting a first of said different signal frequencies to represent a binary 1 during a first portion of a bit interval,

transmitting a second of said different signal frequencies redundantly representing said binary 1 during a second portion of said bit interval,

transmitting a third of said different signal frequencies representing a binary 0 during a first portion of a subsequent bit interval,

transmitting a fourth of said different signal frequencies redundantly representing said binary 0 during a second portion of said subsequent bit interval,



activating a receiver to response only to said first and third signal frequencies during the first portion of each bit interval, and

activating said receiver to respond only to said second and fourth signal frequencies during the second portion of each bit interval.

3,953,799

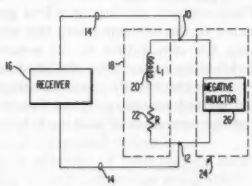
BROADBAND VLF LOOP ANTENNA SYSTEM

Thomas K. Albee, Western Springs, Ill., assignor to The Bunker Ramo Corporation, Oak Brook, Ill.

Continuation-in-part of Ser. No. 769,861, Oct. 23, 1968, abandoned. This application Apr. 9, 1971, Ser. No. 132,895

Int. Cl.² H04B 1/18

U.S. Cl. 325—376 **4 Claims**



1. A broadband antenna system capable of operation over an operating band of a plurality of octaves in the low frequency bands ranging from approximately three kilohertz to three hundred kilohertz without requiring tuning to resonance for individual frequencies within the band, said antenna system comprising:

an antenna adapted for antenna operation in said low frequency bands, said antenna having an inherent inductance L_1 providing an inductive reactance X_L which varies with frequency f over said operating band in accordance with the equation $X_L = 2\pi fL_1$, and

a negative inductive reactance circuit electrically coupled in parallel with said antenna and having a negative inductance $-L_2$ chosen to provide a negative inductive reactance $X_L = 2\pi f(-L_2)$ over said operating band which is substantially equal to the inductive reactance X_L provided by said inherent inductance.

3,953,800

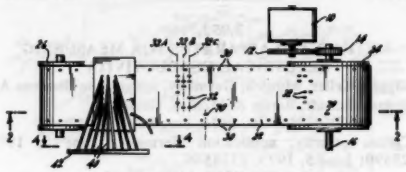
TUNING INDICATOR FOR A RADIO FREQUENCY RECEIVER

Tadao Nakamura, Flushing, N.Y.; Barry C. Detwiler, New Milford, N.J., and John A. Marchetti, Staten Island, N.Y., assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Oct. 26, 1973, Ser. No. 409,940

Int. Cl.² H04B 1/06; H03J 1/04

U.S. Cl. 325—455 **4 Claims**



1. The combination with a receiver tunable to one of a plurality of radio frequency carrier signals transmitted from broadcast stations of a tuning indicator for producing a digital display indicative of the frequency of the carrier signal transmitted from a selected broadcast station, said tuning indicator including a display panel, a first light source, a fiber optic bundle including a plurality of optic fibers, said plurality of optic fibers having their proximal ends positioned at a reading position to receive light from said first light source and their distal ends terminating on said display panel in segments of a numerical display, a station frequency encoder having a plurality of sets of station indicia, each set of station indicia representative of the carrier frequency of one of said broadcast stations, said station frequency encoder further including a plurality of alignment indicia, at least one of said plurality of alignment indicia cooperatively positioned and associated with each set station indicia, means mounting said station frequency encoder for movement relative to the reading position, and means for indicating the alignment of a set of station indicia at the reading position including a second light source, a first optic fiber coupled between said second light source and the reading position and arranged for alignment with the alignment index associated with said one set of indicia, a light sensitive device, a second optic fiber having its proximal end positioned at the reading position for alignment with said alignment index and its distal end coupled to said light sensitive device, said light sensitive device being responsive to light transmitted from said second light source through said first optic fiber, said alignment index, and said second optic fiber to said light sensitive device when said one set of station indicia is aligned at the reading position for producing a first control signal and means responsive to said first control signal for actuating said first light source, light being transmitted from said first light source, through said station indicia and said optic fibers aligned with said indicia to illuminate segments of said numerical display to produce a display indicative of the frequency of the carrier signal received by said radio frequency receiver.

3,953,801

RECEIVER DIGITAL CONTROL SYSTEM

Robert R. Podowski, Elmhurst, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed June 3, 1974, Ser. No. 475,739

Int. Cl.² H04B 1/26

U.S. Cl. 325—464 **10 Claims**

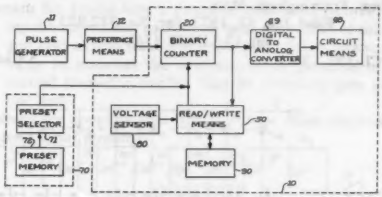
1. A broadcast receiver including a voltage adjustable characteristic comprising:

common control means including binary counting means, converting means for translating the data output of said counting means to a corresponding voltage, and circuit

means responsive to said voltage for adjusting said voltage adjustable characteristic;

preference means enabling operator control of said counting means;

preset means for resetting said counting means to a prescribed data configuration to produce a control voltage of



a predetermined value corresponding to a predetermined adjustment of said adjustable characteristic; and

means for re-establishing the last existing data configuration of said counting means upon subsequent reactivation of said receiver.

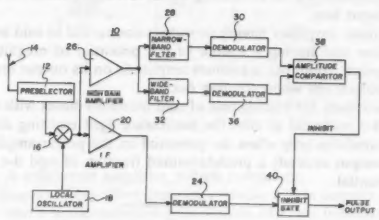
3,953,802
ADJACENT CHANNEL REJECTOR

George F. Morris, Pittsford; David L. Babcock, West Henrietta, and Eugene A. Peterson, Penfield, all of N.Y., assignors to Edmac Associates Inc., East Rochester, N.Y.

Filed June 6, 1974, Ser. No. 477,014

Int. Cl.² H04B *1/10*

U.S. Cl. 325—474 **1 Claim**



1. An adjacent channel rejector for use in a communication system such as a TACAN system, which has a predetermined bandwidth in a channel of interest, for determining if a received signal is either a desired signal or an undesired signal; the desired signal being one which has a center frequency in the determined channel bandwidth, and the undesired signal being one which has a center frequency outside the predetermined channel bandwidth but which introduces significant energy into the predetermined channel bandwidth, comprising:

a. high gain amplifier means responsive to the desired signal to provide a corresponding amplified output signal and to the undesired signal for being driven into saturation;

b. a wide band filter connected to said high gain amplifier means and having a bandpass selected to be greater than the predetermined channel bandwidth and for producing a wide band filter output signal in response to either the desired signal or the undesired signal;

c. a narrow band filter connected to said high gain amplifier means and having a bandpass within the predetermined channel bandwidth, said narrow band filter being responsive to either (1) the undesired signal to produce a narrow band filter output signal which is substantially lower in level than the wide band filter output signal, or (2) the desired signal to produce a narrow band filter output signal which is substantially equal in level to the wide band filter output signal;

d. comparison means responsive to the energy levels of the output signals of said wide band and said narrow band filters for comparing the said energy levels of the said filter output signals to produce a first signal, when the wide and narrow band filter output signals are substantially equal to thereby indicate that the desired signal is in the channel, and a second signal, when the narrow band filter output signal is substantially lower in level than the wide band output signal to thereby indicate that the undesired signal is in the channel; and

e. inhibit means coupled to receive said received signal and responsive to said second signal for blocking said received signal and responsive to said first signal for passing said received signal.

3,953,803
MEASURING SYSTEM

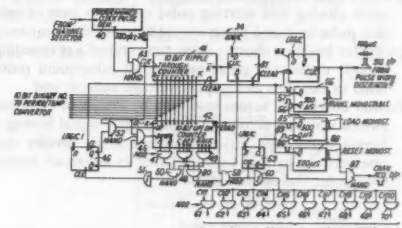
John Henry Gallant, Upminster, and Michael Robert Thomas Johnson, South Ockendon, both of England, assignors to May & Baker Limited, Dagenham, England

Filed Dec. 28, 1973, Ser. No. 429,692

Claims priority, application United Kingdom, Jan. 2, 1973, 00218/73

Int. Cl.² H03K *5/18, 5/20, 9/08*

U.S. Cl. 328—112 **9 Claims**



1. A measuring system comprising a signal processor including a first counter for storing a next following signal representative of the instantaneous value of a parameter being measured, a second counter for storing the previous signal representative of the instantaneous value of said parameter, which serves as a reference signal, comparison means for comparing said reference signal with said next following signal, means for passing to an output the signal held in said first counter whenever it is within a predetermined limit of said reference signal, means for up-dating said second counter by entering said next following signal held in said first counter into said second counter, which signal acts as the next reference signal, and clock pulse generator means for supplying clock pulses to both said counters in response to an input signal to said signal processor.

3,953,804
SWITCHING ARRANGEMENT FOR THE PRODUCTION OF SEQUENTIAL CURRENT PULSES

Hans Dethlefsen; Alfred Hauenstein, and Karl-Heinz Vogl, all of Munich, Germany, assignors to Siemens Atkiengesellschaft, Berlin & Munich, Germany

Filed Nov. 14, 1974, Ser. No. 523,725

Claims priority, application Germany, Nov. 14, 1973, 2356875

Int. Cl.² G01R *29/02;* **H03K** *5/00*

U.S. Cl. 328—130 **3 Claims**

1. In a switching arrangement for a production of sequential current pulses comprising a starting pulse switch, the improvement of

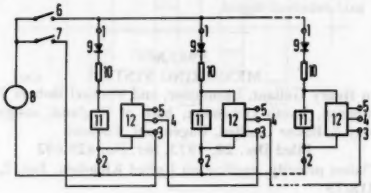
a plurality of pulse units connected by means of a joint feed line, and in series, producing at each time interval one

pulse of a series of pulses and each pulse unit comprising an energy storage capacitance device, a first and second driver, an oscillator, a frequency divider having two outputs for two signals of different delay time, a load, and a pair of switches wherein a first switch is self-holding; wherein

said energy storage capacitance device in each of said pulse units is

connected to said joint feed line for purposes of being charged simultaneously;

connected respectively to said oscillator, said frequency divider, and said second driver by means of said first



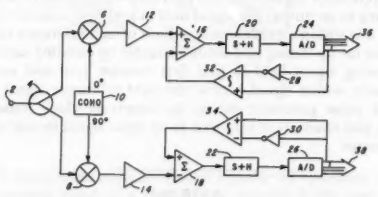
switch, wherein said first switch is activated respectively by a starting pulse operated on by said first driver upon closing said starting pulse switch in case of said first pulse unit, and by an output signal of the frequency divider having a shorter delay time (t_1) of a preceeding serially connected pulse unit for all subsequent pulse units to function as a supply voltage source; and

further connected across said load by means of a second switch which is activated by an output signal having a longer delay time (t_2) of said frequency divider and operated on by said second driver to act as an energy source for the current pulse.

3,953,805
DC COMPONENT SUPPRESSION IN ZERO CF IF SYSTEMS

James Benedict Couvillon, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 7, 1974, Ser. No. 521,721
Int. Cl.² H04B 1/12
U.S. Cl. 328—162 **5 Claims**



1. A signal processing system comprising:

a. a receiver means for receiving an AC signal having an average zero value,

b. an analog to digital converter coupled to the receiver means for receiving as an input the AC signal of the receiver means for providing digital representations including positive and negative sign bit outputs of the received signal,

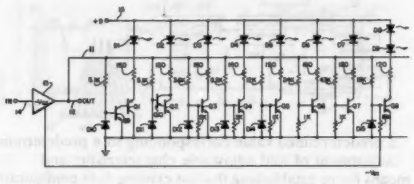
c. error detection means coupled to said analog to digital converter for providing an error signal proportional to the difference between the number of positive and negative sign bit outputs, and

d. summing means coupled to the error detection means for adding the error signal to the analog to digital converter AC signal input whereby the difference between the numbers of positive and negative sign bit outputs is reduced substantially to zero.

3,953,806
DISPLAYING AMPLIFIER OUTPUT AMPLITUDE

Joseph L. Veranth, Marlboro, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Jan. 12, 1973, Ser. No. 322,923
Int. Cl.² H03F 17/00
U.S. Cl. 330—2 **5 Claims**



1. Apparatus for indicating the instantaneous amplitude range in which an output signal amplitude resides comprising,

a plurality of light emitting diodes,

a corresponding plurality of transistors in series with respective ones of said light emitting diodes,

an input line for receiving a signal whose level is to be monitored,

means for coupling the base of each transistor to said input line to progressively render conductive more of said transistors with increasing signal level amplitude on said input line,

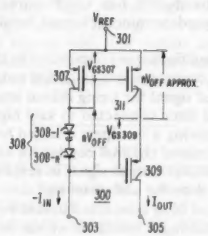
a power amplifier having its output connected to said input line and having a source of d-c potential of magnitude greater than the maximum amplitude on its output terminal except when clipping occurs,

and means for biasing one of said transistor bases with said d-c potential so that the associated light emitting diode conducts only when the potential on the power amplifier output exceeds a predetermined fraction of said d-c potential.

3,953,807
CURRENT AMPLIFIER

Otto Heinrich Schade, Jr., N. Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 387,171, Aug. 9, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,007
Int. Cl.² H03F 3/16
U.S. Cl. 330—35 **41 Claims**



26. A current amplifier comprising:

an input, an output and a common terminal;

first, second and third field effect transistors, each having a gate, a source and a drain electrode;

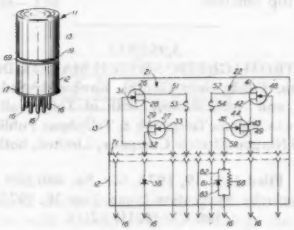
means for coupling the source electrodes of said first and said second transistors to said common terminal;
means for coupling said second transistor drain electrode to said third transistor source electrode;
means for coupling said third transistor gate and drain electrodes to said input terminal and to said output terminal, respectively;
means for establishing a potential difference between said input terminal and each of the gate electrodes of said first and said second transistors, said potential difference of a value to maintain the source-to-drain potential of said second transistor smaller than its source-to-gate potential; and
means for coupling said first transistor drain electrode to said input terminal.

3,953,808

SOLID STATE AMPLIFIER

Charles W. Clark, Pleasant Hill, Mo.; Edwin G. Morton, Lynnfield, Mass., and Robert L. Voss, Lee's Summit, Mo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J. and Western Electric Co., Inc., New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,577
Int. Cl.² H03F 3/16
U.S. Cl. 330—35 **12 Claims**



1. A solid state amplifier, which comprises:
a junction field-effect transistor having a gate contact adjacent a semiconductive gate domain of a first type conductivity; and
an impedance coupled to the gate contact, the impedance including a charge storage device and a resistive impedance, the charge storage device having at least a semiconductive domain of the first type conductivity, a semiconductive domain of the second type conductivity and a junction there between, the domain of the second type conductivity being coupled to the gate terminal and the resistive impedance being coupled across the junction of the charge storage device.

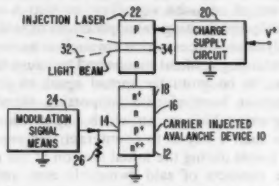
3,953,809

INJECTION LASER MODULATOR

Hirohisa Kawamoto, Kendall Park, N.J., and David Joseph Miller, Philadelphia, Pa., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,757
Int. Cl.² H01S 3/096
U.S. Cl. 331—94.5 H **6 Claims**

1. In combination, a carrier injected avalanche device, an injection laser connected in series with said avalanche device for generating a pulse of coherent light from said injection laser only when both a direct-current voltage of given magnitude across said avalanche device is applied thereto through said injection laser with said injection laser poled to be forwardly conducting and at least a given amount of carriers are injected into said avalanche device, a charge supply circuit coupled across said serially-connected avalanche device and injection laser for supplying said direct-current voltage across said avalanche device until avalanching in said avalanche



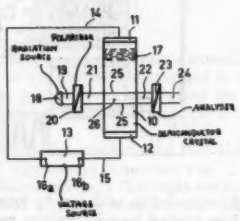
device has taken place, and modulation signal means for injecting said carriers into said avalanche device.

3,953,810

DEVICE FOR MODULATING A BEAM OF RADIATION

Robert Veilex, Paris, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 279,972, Aug. 11, 1972, abandoned, which is a continuation of Ser. No. 48,834, June 10, 1970, abandoned, which is a continuation of Ser. No. 617,544, Feb. 21, 1976, abandoned. This application May 9, 1974, Ser. No. 468,277
Claims priority, application France, Feb. 25, 1966, 66.51123
Int. Cl.² H01S 3/10
U.S. Cl. 332—7.51 **13 Claims**



1. A device for modulating a beam of polarized electromagnetic radiation, comprising a junction free semiconductor crystal positioned in said beam and having contacts, said crystal comprising a semiconductor body having current-voltage characteristic curve including a region of negative differential resistance, means for applying constant value electric field across the crystal between the contacts, and means for analyzing the polarization of the beam of radiation emerging from the crystal, wherein in the crystal said applied electric field produces an entire high resistance zone travelling through the crystal from one contact to the other, said zone having a resistivity and a potential gradient which are higher than the values in the remaining part of the crystal, said zone having for the radiation concerned different polarization shifting properties than the polarization shifting properties of the remaining part of the crystal.

3,953,811

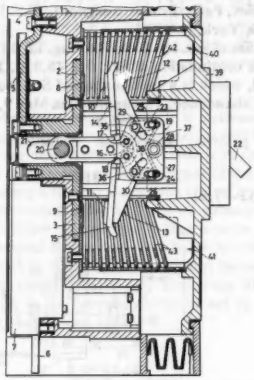
CURRENT-LIMITING ELECTRIC SWITCH EXEMPT FROM BUMPS IN THE OPENING STAGE

Angelo Mostosi, Bergamo, Italy, assignor to Sace S.p.A. Construzioni Elettromeccaniche, Bergamo, Italy

Filed Oct. 15, 1974, Ser. No. 514,487
Claims priority, application Italy, Apr. 12, 1974, 21420/74
Int. Cl.² H01H 77/10
U.S. Cl. 335—16 **1 Claim**

1. A current-limiting electric switch, which comprises at least one couple of electric contacts cooperating with one another and carried by their respective supporting members

and electrically connected to a feeding terminal and a load terminal through an electric current path, of which, when the contacts are closed, said support form two parallel legs along which currents of opposite sign flow, so that a current rise above a preselected limiting value produces in said legs repulsive electrodynamic forces which are such as to overcome the bias of the retaining resilient means and to cause the supporting members to be mutually spread apart to separate the contacts, one at least of said supporting members being formed by a swingable arm on which said resilient retaining means act in such a way as to counteract said repulsive electrodynamic forces during the initial portion of the rotation for opening the contacts of said swingable arm and to assist, conversely, said electro-dynamic forces during the final portion of said contact-opening rotation, characterized in that said resilient retaining means act upon said swingable arm with the intermediary of a pin which is slidably housed in a



guide and connected to said arm by means of a connecting rod, the bias exerted by said resilient means upon said pin being such as to push the pin towards an end position of maximum closeness to the axis of rotation of the swingable arm, said connecting rod and said swingable arm being pivoted to one another at a pivotal point selected in such a way that an opening rotation of the swingable arm compels said pivotal point to be shifted from one side to the other of the line of conjunction between the axis of the pin and the axis of rotation of the swingable arm thus simultaneously causing a to-and-fro movement of the pin along said guide and towards said end position, said pin being so arranged that at the end of the contact-opening rotation of the swingable arm an abutting engagement is obtained between said pin and said swingable arm, said guide being extended in such a direction that said abutting engagement tends to bring said pin away from said end position again.

3,953,812

ELECTRIC CIRCUIT BREAKER

Eldon Bertel Heft, West Hartford, and Joseph Francis Johnson, Plainville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Oct. 9, 1974, Ser. No. 513,397
Int. Cl.² H01H 73/48
U.S. Cl. 335—23 **26 Claims**

1. An electric circuit breaker comprising, in combination:

A. an insulative case;

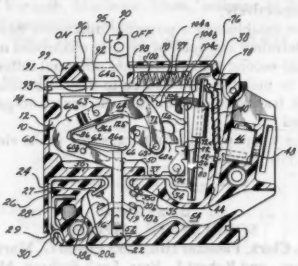
B. a frame positionally mounted in said case;

c. a trip mechanism mounted by said frame;

D. an operating mechanism mounted by said frame;

E. at least one fixed contact and one movable contact;

F. a contact carrier for said movable contact mounted by said case for reciprocal movement between open and closed contact positions, said carrier operatively connected to said operating mechanism for movement to said open and closed contact positions;



G. an operating handle mounted by said case and acting on said operating mechanism to effectuate said open and closed contact positions; and

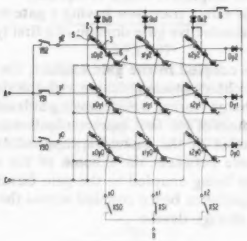
H. an operating spring acting on said carrier to separate said contacts and on said operating mechanism to automatically reset said operating mechanism immediately following a trip function.

3,953,813

ELECTROMAGNETIC SWITCH MATRIX DEVICE

Norio Yano, Fussa; Seiei Okoshi, Kawasaki; Sadayuki Mitsuhashi, and Norio Suzuki, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation and Nippon Electric Company, Limited, both of Tokyo, Japan

Filed June 19, 1974, Ser. No. 480,809
Claims priority, application Japan, June 20, 1973, 48-68655
Int. Cl.² H01H 67/14
U.S. Cl. 335—112 **14 Claims**



1. An electromagnetic switch matrix device comprising a plurality of row signal lines; a plurality of column signal lines intersecting substantially at right angles to said row single lines; a plurality of electromagnetic switching elements disposed at the respective cross-points between said row and column signal lines so as to bridge the corresponding row and column signal lines when their contact points are electromagnetically closed; first, second, third and fourth winding means wound around said electromagnetic switching elements so as to generate control magnetic fields for controlling the operations of the respective switching elements; a plurality of row control lines corresponding to said respective row signal lines, each of which includes said first winding means for generating the control magnetic fields in common to all the cross-points aligned on the corresponding row as well as said second winding means for generating the control magnetic fields in common to all the cross-points aligned on the corresponding row;

a plurality of column control lines corresponding to said respective column signal lines, each of which includes said third winding means for generating the control magnetic fields in common to all the cross-points aligned on the corresponding column as well as said fourth winding means for generating the control magnetic fields in common to all the cross-points aligned on the corresponding column; and means for selectively short-circuiting said second winding means and said third winding means at least in a selected row control line and in a selected column control line, respectively; the polarity of said first, second, third, and fourth winding means being such that when a predetermined polarity of current pulse is passed through said row and column control lines, said second and third winding means may generate control magnetic fields in the opposite direction to that generated by said first winding means, while said fourth winding means may generate a control magnetic field in the same direction as that generated by said first winding means.

3,953,814

POLARIZED ELECTRO-MAGNETIC RELAY

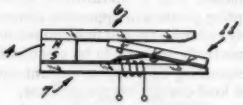
Egbert Kuipers, Heiligenhaus, Germany, assignor to Hartmann & Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 18, 1975, Ser. No. 614,658

Claims priority, application Germany, Sept. 21, 1974, 2445196

Int. Cl.² H01F 7/08

U.S. Cl. 335—230 **2 Claims**



1. Polarized electro-magnetic relay having an E-shaped yoke member with a center and two outer legs and transverse bar, further having an U-shaped yoke member with two legs and a transverse bar, said transverse bars of said members being interconnected and spaced by a permanent magnet, so that said outer legs are respectively aligned with said legs of the U-shaped members, there being a coil on the center leg, the center leg being longer than the outer legs, the relay further having an armature of U-shaped configuration and having two legs and a transverse bar, the armature being disposed so that its transverse bar faces said center leg and the two legs are in an alignment space respectively between the two legs of the U-shaped yoke member and said outer legs the armature actuating relay contacts, the improvement comprising:

a pair of long, flat springs, each having a first end fastened to the E-shaped yoke member at the transverse bar thereof, and having a second end fastened to the transverse bar of the armature at a location from which one of the legs thereof extend, said springs each having a crimped portion having flexibility in the direction of extension of the respective spring.

3,953,815

CAST-RESIN INSULATED INSTRUMENT TRANSFORMER, IN PARTICULAR POTENTIAL TRANSFORMER

Friedrich Raupach, Wildensorger Strasse 9, D-8600 Bamberg, Germany

Filed Nov. 7, 1974, Ser. No. 521,713

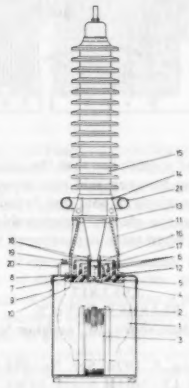
Claims priority, application Germany, Nov. 15, 1973, 2356988

Int. Cl.² H01F 27/02

U.S. Cl. 336—90 **7 Claims**

1. In a compact cast-resin insulated instrument transformer having a cast-resin body and a high-voltage connector extending out of the body, the improvement comprising:

a generally planar cast-resin bushing insulator connected directly to said body and coaxially encircling said high-voltage connector, said insulator having a plurality of coaxially arranged sheds extending upwardly therefrom to increase creepage distance, said sheds respectively increasing in height in a direction radially outwardly from said high-voltage connector, a pair of coaxial guide sleeves disposed radially inwardly of said sheds, and a cast-resin flange section surrounding the periphery of said bushing insulator;



a high-voltage bushing having a conductor extending therethrough, and one end thereof dimensioned to be insertable within said guide sleeves for aligning the same on said bushing insulator immediately adjacent to said high-voltage connector;

means for connecting the conductor of said high-voltage bushing to said high-voltage connector; and

an intermediate flange defining a fluid-tight enclosure to be filled with a fluid insulating medium, one end of said intermediate flange being connected to said cast-resin body and enclosing said sheds, the other end of said intermediate flange being connected to said high-voltage bushing thereby enclosing said connection between said shield and said high-voltage connector within said fluid insulating medium of said intermediate flange enclosure.

3,953,816

POSITION DETECTING SYSTEM

Jacques Michel Hennequin, St Maurice, France, assignor to Compagnie (Societe) Anonyme, Paris, France

Filed Oct. 1, 1973, Ser. No. 402,548

Claims priority, application France, Oct. 10, 1972, 72.35824

Int. Cl.² H01F 21/04

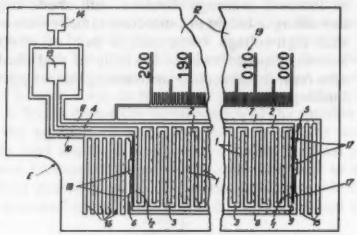
U.S. Cl. 336—119 **6 Claims**

1. A position detecting system comprising, in combination:

pick-up means mounted for movement back and forth along a given path; and

sending means located in spaced relation to and extending along the direction of said path for producing alternate nodes and antinodes in said pick-up means at spaced increments of movement of the latter along said path, said sending means comprising a conductor arranged in a Greek key pattern essentially symmetrical with respect to said path and presenting equidistantly spaced and parallel legs including opposite end legs, all of which legs are of equal widths, and a return-path conductor connected to one of said end legs adjacent the end thereof and at a point asymmetrical with respect to said path, said return-

path conductor branching from said point of connection with one branch extending therefrom parallel to said one leg, said one branch being spaced from said one end leg by an amount less than the equidistant spacing between



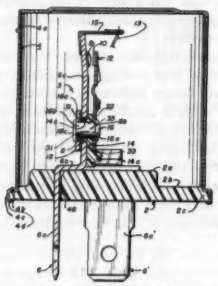
legs and being of a width less than the equal widths of said legs, the spacing between said one branch and said one end leg and the width of said one branch being coordinated to produce a clearly recognizable signal at said pick-up means when same is positioned thereover.

3,953,817

FLASHER DEVICE

James P. Covert, Schaumburg, Ill., assignor to Littelfuse, Inc., Des Plaines, Ill.

Filed Aug. 5, 1974, Ser. No. 494,874
Int. Cl.² H01H 61/06, 61/01
U.S. Cl. 337—136 9 Claims



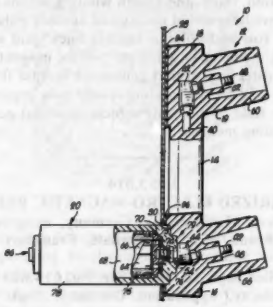
1. A flasher device comprising: a support base; a pair of terminals anchored to said support base, one of the terminals having an inner extension with a stationary contact carried thereby and in direct electrical and physical contact therewith; a conductive heat responsive means having a movable contact in direct electrical and physical contact therewith and to be positioned in confronting relation to said stationary contact; an insulating member positioned between the heat responsive means and the terminal extension, and an insulated rivet clamping said heat responsive means and insulating member to said terminal extension, so the heat responsive means is insulated from said terminal extension, said other terminal being welded directly to said heat responsive means; and heating means electrically connected across the heat responsive means and the terminal extension to receive current until shunted by said contacts and positioned to heat at least portions of the heat responsive means to a temperature where it moves into a position where said movable contact carried thereby engages said stationary contact to short circuit the heating means until the heating means cools.

3,953,818

EXTERNALLY BUSSED, ENCAPSULATED CURRENT LIMITING FUSE FOR PAD MOUNTED TRANSFORMERS

Vance B. Martin, Charlotte, N.C.; George D. Allen, Centralia, Mo.; Harold D. Haubein, Centralia, Mo.; Melvin B. Goe, Jr., Centralia, Mo., and Kenneth A. Toeniskoetter, Washington, Mo., assignors to A. B. Chance Company, Centralia, Mo.

Filed Mar. 28, 1975, Ser. No. 563,161
Int. Cl.² H01H 85/22
U.S. Cl. 337—191 19 Claims



1. In combination with a transformer, external bus and current interrupting protection apparatus comprising:

a bus assembly including spaced first and second connecting means respectively adapted to be electrically connected with corresponding first source-current-carrying means and second load-current-carrying means,

there being insulated conductor means electrically interconnecting said first and second connecting means;

current interrupting means secured to said bus assembly;

means electrically connecting said first connecting means with said current interrupting means such that the latter receives source current from said first currentcarrying means;

means mounting said bus assembly proximal to the external face of a tank wall of said transformer to define an external electrical feed loop through the externally mounted bus assembly; and

means electrically connecting the load side of said current interrupting means with a winding of said transformer.

3,953,819

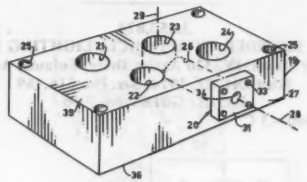
FLOW SENSORS

Donald Keerie, Ewhurst; John Anthony Gordon Hammond, Guildford, and Peter Michael Hamey, Emsworth, all of England, assignors to Sperry Rand Limited, London, England

Filed Oct. 7, 1974, Ser. No. 512,491
Claims priority, application United Kingdom, Oct. 10, 1973, 47212/73
Int. Cl.² H01C 13/00
U.S. Cl. 338—36 14 Claims

1. A flow sensor for producing an electrical signal dependent upon the rate of fluid flow comprising a block having a flow passage therein through which the fluid flows, said block having an access opening whose axis extends transversely to said flow passage, said opening intersecting said passage, and a sensor cartridge fitted in said access opening, said sensor cartridge comprising a housing, a flap pivoted to said housing about an axis transverse to the axis of said flow passage, spring means in said housing biasing said flap to a position in which said flap obturates said flow passage, said flap being progressively displaced from said obturating position against said spring means by fluid flow through the passage as the rate of

fluid flow increases, and mechanical/electrical transducer means in said housing for converting the angular displacement

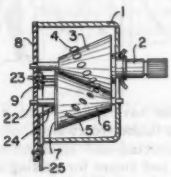


of said flap into an electrical signal corresponding to the flow rate.

3,953,820
VARIABLE RESISTOR

Matsuo Nishioka, Hirakata; Yasuo Takeyoshi, Kadoma, and Shunzo Oka, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

Filed Aug. 29, 1974, Ser. No. 501,432
Int. Cl.² H01C *10/04*
U.S. Cl. 338—89 **1 Claim**

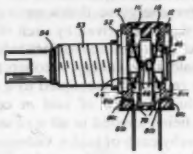


1. A variable resistor device comprising:
a casing;
a first conical non-conductive member rotatably mounted within said casing, said first conical member having a plurality of helically arranged peripheral protuberances on the surface thereof;
operating shaft means for rotating said first conical member;
a second conical non-conductive member rotatably mounted within said casing, said second conical member being oriented invertedly with respect to and in rolling contact with said first conical member and having a plurality of helically arranged peripheral recesses meshing with said plurality of peripheral protuberances, said second conical member being driven by said first conical member;
a conductive contactor extending from the base of said second conical member;
a dielectric base plate secured to said casing;
a variable resistor and an electrical contact element secured to said base plate, said contact element being in frictional contact with said contactor; and
brush means electrically connecting said contactor with said variable resistor, said contact element being displaced at a varying rate as said operating shaft is rotated at a constant rate thereby providing a non-linear resistance characteristic.

3,953,821
VARIABLE RESISTANCE CONTROL

William L. Kelver, Cassopolis, Mich.; Ronald L. Stuckey, Monroe, and Arthur L. Rozema, Elkhart, both of Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Dec. 9, 1974, Ser. No. 530,749
Int. Cl.² H01C *5/02*
U.S. Cl. 338—174 **9 Claims**

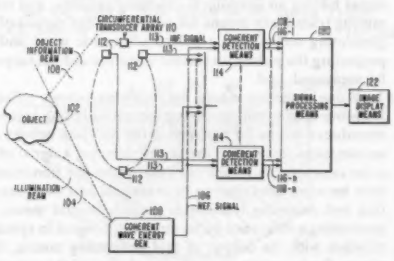


1. In a variable resistance control, the combination of a first ceramic substrate and a second ceramic substrate, one of the substrates being provided with an aperture, an electrically nonconductive skirt spacing the first substrate from the second substrate and defining a cavity therebetween, said substrates having first and second surfaces and being provided with a plurality of openings, an arcuate resistance film supported on each of said first surfaces, an arcuate collector supported on each of the first surfaces, a plurality of terminals received in the openings and electrically connected to each of the collectors and to each of the ends of the resistance films, an electrically nonconductive driver disposed between said first substrate and said second substrate, a shaft engaging the driver for rotation thereof, a first contactor constrained to rotate with the driver and wipably engaging the resistance film and the collector supported on said first substrate, a second contactor constrained to rotate with the driver and wipably engaging the resistance film and the collector supported on said second substrate, said driver being journaled in the aperture, a fastener securing the first substrate and the second substrate and the skirt together, said skirt comprising an arcuate section, a first post, a second post spaced apart from the first post and a bridge section interconnecting the posts, the openings being disposed in a line with the posts, the periphery of the bridge section substantially coinciding with a portion of the periphery of the substrates.

3,953,822
WAVE-ENERGY IMAGING TECHNIQUE

David Herman Raphael Vilkomerson, South Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,218
Int. Cl.² G01S *7/04, 7/56*
U.S. Cl. 340—1 R **15 Claims**



1. A wave-energy imaging system comprising a circumferential array of *n* wave-energy transducers spaced at predetermined points about the circumference of a circle defining an

aperture of many wavelengths in diameter, means for illuminating an object to be imaged with *m* different characteristic coherent components of wave energy and at the same time generating an individual reference signal component for each of said *m* components of said coherent wave energy, said illuminated object deriving an individual object-information coherent component of said wave energy for each of said *m* different characteristic components, said aperture being within the path of all said object-information coherent components of said wave energy so that a separate object-information component signal is derived by each of said *n* transducers for each of said *m* individual object-information coherent components of said wave energy, *n* coherent detection means each of which is respectively coupled to a corresponding one of said *n* transducers, each of said *m* components of said reference signal being applied to all *n* of said coherent detection means, whereby each of said *n* coherent detection means derives output signals manifesting real and imaginary coefficients of a complex number for each of said *m* object-information component signals applied to that coherent detection means from the transducer corresponding thereto, said coefficients defining the relative phase and amplitude of each of said *m* object information coherent components of wave energy for each of said *n* transducers, and signal processing means responsive to the output signals from said coherent detection means for deriving with a given resolution the relative intensity at image points whose wavefronts fall on said entire aperture.

3,953,823

VELOCITY MEASUREMENT APPARATUS USING PULSED ULTRASONIC WAVES

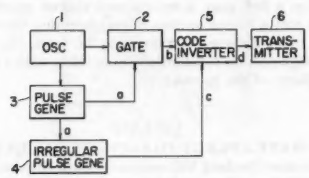
Kageyoshi Katakura, Tokyo, Japan, assignor to Hitachi Medical Corporation, Japan

Filed Mar. 31, 1975, Ser. No. 563,396

Claims priority, application Japan, Mar. 29, 1974, 49-35745

Int. Cl.² G01S 9/68

U.S. Cl. 340—1 R **17 Claims**



1. Velocity measurement apparatus comprising:

transmitting means for projecting a pulsed ultrasonic wave toward at least one target, said transmitting means including generating means for generating a pulse modulated signal having an irregularly changing polarity, and transmitting transducer means for converting the output of the generating means into a pulsed ultrasonic wave and for projecting the pulsed ultrasonic wave toward the target to be measured; and

at least one receiving means for receiving echoes reflected from the target, said receiving means including receiving transducer means for converting the received echoes into an electrical signal, first means for deriving a signal of the echo components which are delayed by the transmission time between the target to be measured and the transmitting and receiving transducer means, second means for generating a reference pulse modulated signal in synchronization with the output of said generating means, third means for inverting the polarity of one of the output of the first means and of the second means in correspondence with the irregularity in the polarity of the signal provided by said generating means, phase comparator means for comparing the output of said third means with one of the output of said first and said second means, and frequency analyzer means for determining the Doppler shift in response to the output of said phase comparator means.

3,953,824

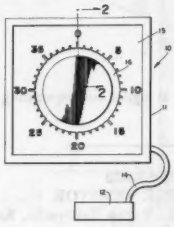
DEPTH SOUNDER WITH INDICIA LIGHTING MEANS

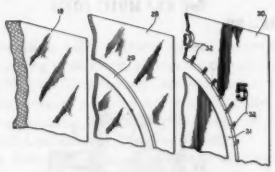
Leonard Y. Dean, IV, 320 Azalea Drive, Eufaula, Ala. 35901

Filed Oct. 21, 1974, Ser. No. 516,169

Int. Cl.² G01S 9/68, 7/56

U.S. Cl. 340—3 C **5 Claims**





1. A depth sounder having a dial face, a plurality of indicia on said dial face, a flasher rearwardly of said dial face, said flasher being constructed and arranged to sweep past said plurality of indicia, and means for causing said flasher to flash, a viewing area defined by said dial face through which said flasher can be observed, said viewing area being adjacent to said plurality of indicia, said plurality of indicia comprising light diffusing means, the arrangement being such that when said flasher is caused to flash said light diffusing means will receive light from said flasher to cause illumination of at least some of said plurality of indicia.

3,953,825

ELECTRONICALLY FOCUSED IMAGING SYSTEM AND METHOD

Gordon S. Kino, Stanford; Calvin F. Quate, Los Altos Hills, and James F. Havlice, Los Altos, Calif., assignors to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed July 12, 1974, Ser. No. 487,979

Int. Cl.² G01V 1/00; H04B 13/00; H04R 15/00

U.S. Cl. 340—5 MP **22 Claims**

1. An acoustic imaging apparatus for transmitting focused acoustic waves at an object of interest for scanning the focused waves incident on the object of interest, comprising:

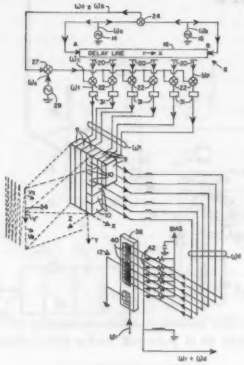
a linear array of acoustic wave transmitting transducers;

means for generating chirp signals that focus the acoustic waves transmitted by the array;

means connected to the chirp signal generating means for sequencing said chirp signals and for generating focusing pulses, said array being connected thereto for receiving said pulses and for generating from the focusing pulses acoustic waves focused into a focal line;

a linear array of receiving transducers proximate to the array of transmitting transducers for receiving the acous-

tic waves from the transmitting transducers; and



scanning means in a receiver assembly connected to the array of receiving transducers for scanning the focal line with the array of receiving transducers.

3,953,826

SUPER LONG SEISMIC SOURCE

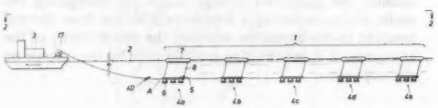
Dennis R. Brundrit, Calgary, Canada, and Jacobus C. van Wijnen, The Hague, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 446,193, Feb. 25, 1974, abandoned. This application May 15, 1975, Ser. No. 577,575

Claims priority, application Canada, Mar. 8, 1973, 165556

Int. Cl.² G01V *1/02, 1/13*

U.S. Cl. 340—7 PC **12 Claims**



1. An elongated seismic source for use in marine seismic explorations wherein a vessel is used to tow the source over areas being surveyed, said source comprising;

a plurality of individual seismic sources, said sources being concentrated in several distinct arrays, each array having at least one source;

a plurality of support means, the seismic sources of each array being coupled to an individual one of said support means;

a plurality of flotation means, at least one flotation means being attached to each support means; and

a plurality of cables, each of said cables being attached to the support means of an individual array to tow said array and pass signals and power between the vessel and said particular array, said plurality of cables being disposed to tow all of said arrays of the elongated source in a substantially in-line arrangement.

3,953,827

METHOD OF DETERMINING THE ANGULAR POSITION OF A TOWED MARINE SEISMIC CABLE AND APPARATUS FOR CARRYING OUT SAID METHOD

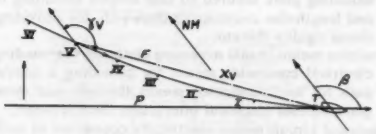
Robert Le Moal, Louveciennes; Jacques Cholet, L'Etang-La-Ville, and Daniel Saussier, Elisabethville-Epone, all of France, assignors to Entreprise de Recherches et d'Activites Petrolieres (E.R.A.P.), Paris, France

Filed Feb. 19, 1974, Ser. No. 443,251

Claims priority, application France, Feb. 21, 1973, 73.06123

Int. Cl.² G01V *1/00*

U.S. Cl. 340—7 R **11 Claims**



1. A system for determining the position in space of a plurality of seismic echo receivers distributed along the length of a towed cable comprising, a plurality of measuring device receptacles secured to said cable among the receivers, and spaced from each other; each receptacle having zero floatability and stabilized along its horizontal axis, each receptacle containing angle measuring means for measuring the angle between the tangent to the cable at the location of said device and a fixed and known direction, means for controlling the occurance of an output from said measuring means, and means for coding and transmitting the value of the measurement, in the form of electronic pulses, to a utilization station via connector and conductor means;

each receptacle containing distance measuring means for measuring the distance separating said device from a generator of seismic waves, and means for coding and transmitting the values of the distance measurement, in the form of electronic pulses, to a utilization station via connector and conductor means; and

each receptacle containing means for measuring the depth of immersion of said device, and means for coding and transmitting the values of the depth measurement in the form of electronic pulses to a utilization station via connector and conductor means.

3,953,828

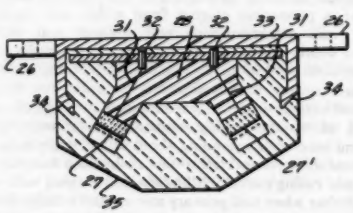
HIGH POWER-WIDE FREQUENCY BAND ELECTROACOUSTIC TRANSDUCER

Rufus Lee Cook, Panama City, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 8, 1968, Ser. No. 775,994

Int. Cl.² G01V *1/00*; H04B *13/00*; H04R *15/00*

U.S. Cl. 340—9 **10 Claims**



1. An electroacoustic transducer assembly comprising:

a plurality of piezoelectric elements for converting electrical energy to acoustic energy and vice versa;

electrical conductor means joined to said piezoelectric elements for transmitting electrical energy to and from said piezoelectric elements;

a shaped mounting means surrounding said electrical conductor means and secured to said plurality of piezoelectric elements, forming each of said piezoelectric elements into a predetermined nonplanar configuration, spacing said piezoelectric elements to form a predetermined nonplanar spatial configuration, and made of a pressure release material, so as to effectively combine the radiation patterns of the individual elements to form a single composite radiation pattern having predetermined characteristics;

a mounting plate secured to said shaped mounting means and lengthwise coextensive therewith, for providing torsional rigidity thereto;

insulator means in said mounting plate and surrounding said electrical conductor means for providing a conducting path for said conductor means through said mounting plate without electrical interaction therebetween;

electrical circuit means electrically connected to said conductor means for obtaining an optimum transfer of electrical energy between said piezoelectric elements and predetermined utilizing electrical devices; and

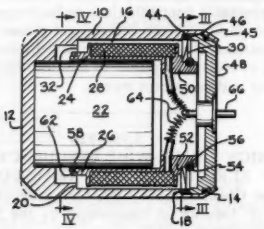
housing means enclosing said plurality of piezoelectric elements together with all the aforerecited means for providing a unitary transducer assembly of compact dimensions.

3,953,829

PARTIALLY FILLED FLUID DAMPED GEOPHONE

Charles F. Boyle, Jackson, Mich., assignor to Sparton Corporation, Jackson, Mich.

Filed Feb. 18, 1975, Ser. No. 550,830
Int. Cl.² G01V *1/18*
U.S. Cl. 340—17 R **3 Claims**



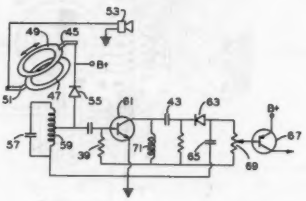
1. A fluid damped geophone for sensing vibrations along a substantially horizontally oriented primary axis comprising, in combination, a casing having a primary axis and defining a chamber, a permanent magnet fixed within said casing, an annular coil circumscribing said magnet and movably mounted within said casing upon a pair of diaphragm springs for axial movement in the direction of said primary axis, said diaphragm springs each comprising an outer rim mounted upon said casing, an inner rim mounted to said coil, and a plurality of involute spring elements interconnecting said outer and inner rims extending about said primary axis, electrical conductors connected to said coil, and a damping fluid within said casing partially filling the unoccupied void within said chamber when said primary axis is substantially horizontally disposed whereby the length of said spring elements immersed in said fluid varies to suppress cross axis resonant vibrations within said springs.

3,953,830

STEERING MECHANISM INACTIVITY WARNING DEVICE

Don W. Williams, Elida, Ohio, assignor to Floren R. Klopfenstein, Fort Wayne, Ind.

Filed Feb. 27, 1974, Ser. No. 446,319
Int. Cl.² B60Q *1/00*; H01H *9/00*
U.S. Cl. 340—52 R **17 Claims**



1. A safety device for providing an alarm indicative of inadequate steering activity by a vehicle operator comprising:

mechanical to electrical transducer means for providing a broad-band electrical signal in response to steering activity by the operator for all operable positions of the steering mechanism, the transducer converting mechanical movement directly to electrical energy;

amplifier means for amplifying at least part of the frequency spectrum of the transducer provided signal;

a capacitor;

means coupling the capacitor to the amplifier means for employing the amplified at least part of the signal to maintain a charge on the capacitor in a preferred charge range;

an energizable audio alarm; and

means responsive to the charge on the capacitor falling outside the preferred charge range for energizing the audio alarm including a transistor with the base thereof coupled to the capacitor whereby the conductivity of the transistor is determined at least in part by the charge on the capacitor.

3,953,831

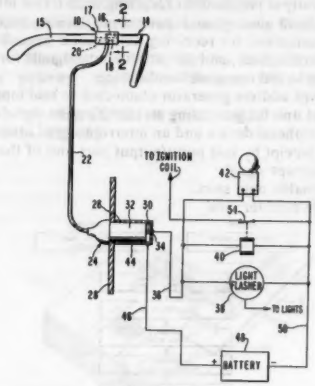
ALARM SYSTEM FOR USE WITH CIGARETTE LIGHTER RECEPTACLE OF VEHICLE

Richard J. Estrada, 758 Arkansa, San Francisco, Calif. 94197

Filed July 9, 1973, Ser. No. 377,365
Int. Cl.² B60Q *1/52*; B60K *28/00*
U.S. Cl. 340—53 **3 Claims**

1. An alarm system for a vehicle having a battery and a dashboard provided with a cigarette lighter receptacle, the combination with said battery and said receptacle of: a pair of eyeglasses having a temple; a switch having means for removably mounting the same on the temple and adapted to be actuated in response to a predetermined head movement when the eyeglasses are worn; cable means coupled to said switch and including a plug removably receivable in said receptacle for placing the switch in electrically coupled relationship to the receptacle, a number of alarm devices; and

means connecting each alarm device in a respective electrical circuit with the receptacle and the battery common to each



circuit, whereby actuation of each device will occur when the switch is actuated and when the plug is in the receptacle.

3,953,832

REMOTE CONTROL OF BROADCAST RECEIVERS

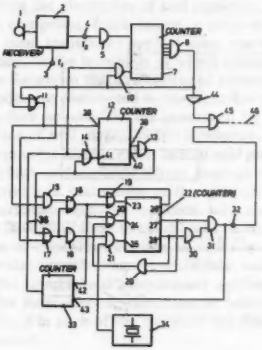
Wulf-Christian Streckenbach, Hemmingen, Germany, assignor to Licentia Patent Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 1, 1975, Ser. No. 564,218

Claims priority, application Germany, Apr. 5, 1974, 2416601

Int. Cl.² H04B 7/00

U.S. Cl. 340—171 R **10 Claims**



1. In a circuit arrangement for evaluating received remote control alternating signals by counting the number of periods thereof, the improvement comprising: an oscillator producing oscillations which are utilized for the signal evaluation, the frequency of the oscillations produced by said oscillator being higher than the frequency of the received alternating signals; a counter; and means connecting said oscillator and the received alternating signals to said counter, said connecting means being controlled by the received alternating signals in a manner such that when the received signals are present at a sufficient amplitude said counter emits a pulse during each received signal period and when the received signals have insufficient amplitude due to interference, said counter frequency-divides the oscillator oscillations down to the frequency of the received signals, whereby interruptions in the received signals have no influence on the operation of subsequent circuit portions of said arrangement.

3,953,833

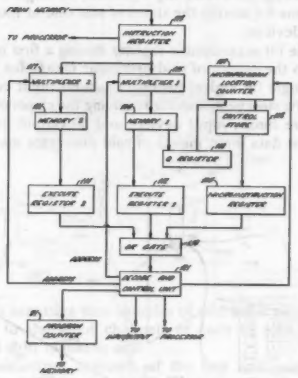
MICROPROGRAMMABLE COMPUTER HAVING A DUAL FUNCTION SECONDARY STORAGE ELEMENT

Allen L. Shapiro, Irvine, Calif., assignor to Technology Marketing Incorporated, Santa Ana, Calif.

Filed Aug. 21, 1974, Ser. No. 499,322

Int. Cl.² G06F 9/06, 9/16, 13/00

U.S. Cl. 340—172.5 **26 Claims**



1. A microprogram computer having a control element for executing a series of control steps in response to a machine language instruction word stored in a memory, said control element comprising:

a control storage element connected to access data from said memory and storing microinstructions defining plural sequences of steps for decoding portions of said machine language words to produce first output data partially defining control steps for said computer;

a secondary storage element, connected to access data from said memory and responsive to said machine language words for decoding a different portion of said machine language words to produce second output data partially defining control steps for said computer, and for selecting one of said plural sequences of said control storage element in response to said machine language words;

means for merging said first and second output data of said control storage element and said secondary storage element to produce third output data defining said series of control steps for said computer; and

a control unit connected to said merging means and producing output timing and controlling data to said computer for execution in accordance with said third output data.

3,953,834

PROGRAMMABLE LOGIC CONTROLLER WITH PUSH DOWN STACK

Bobby G. Burkett, Richardson, and Raymond W. Henry, Dallas, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 7, 1974, Ser. No. 431,538

Int. Cl.² G06F 15/20, 9/06, 13/00

U.S. Cl. 340—172.5 **5 Claims**

1. A programmable logic controller implemented in semiconductor integrated circuit units for generating signals to control one or more binary output devices as logical functions

of the states of one or more binary input devices, said controller being comprised of:

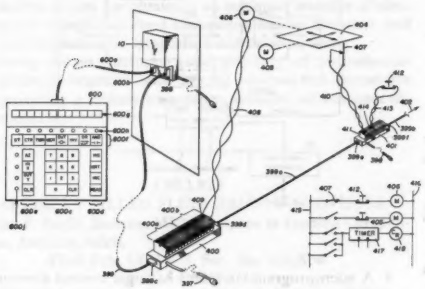
a. means for controlling the sequence of operations of said controller;

b. memory means for storing multi-bit instructions corresponding to said logical functions;

c. boolean processor means coupled to said memory means, said processor means being responsive to said instructions and having first and second data input means and an output, said processor means for logically combining single bits of data simultaneously applied to said first and second inputs according to selected ones of said instructions to generate a single bit logical result;

d. first storage means having a plurality of single bit storage locations for storing the states of said one or more binary input devices;

e. a single bit accumulator register having a first input coupled to the output of said processor means for receiving said single bit logical results, a second input coupled to said first storage means for receiving the states of said one or more binary input devices and an output coupled to the first data input means of said processor means;



f. means coupled to said memory means and responsive to said instructions stored therein for selecting the states of one or more of said binary input devices to be transferred to said processor means;

g. means coupling said first storage means to the second input means of said processor means for transferring the selected states to said processor means; and

h. a reversible serial storage means having an input coupled to said accumulator register for receiving and storing the single bit logical results transferred to said accumulator register by said processor means in a predetermined order when said results are partial results of said logical functions and an output coupled to the second input means of said processor means for transferring the partial results stored therein to said processor means in the reverse order from said predetermined order whereby said partial results are logically combined by said processor means to generate final single bit solutions for controlling said output devices according to the states of said input devices.

3,953,835

METHOD AND APPARATUS FOR ADAPTING A DATA PROCESSING PORT TO RECEIVE AND TRANSMIT DIFFERENT FREQUENCY SIGNALS

Allen B. J. Cuccio, and John P. Stafford, both of Oklahoma City, Okla., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Jan. 18, 1974, Ser. No. 435,136

Int. Cl.² **G06F** *3/04;* **G05B** *1/08;* **G04F** *3/08;* **G05B** *19/28*

U.S. Cl. 340—172.5 **5 Claims**

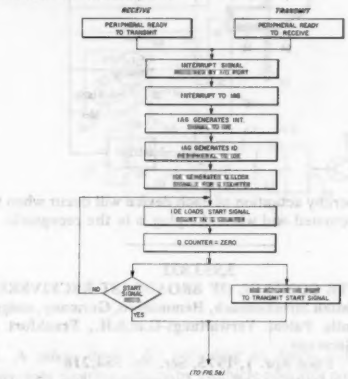
1. Apparatus for adapting a data processor to communicate in real time with peripheral devices respectively using different frequency signals in a receive or a transmit mode comprising:

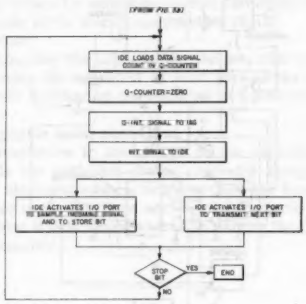
an input/output port unit for receiving an external interrupt signal from one of said peripheral devices requesting communication, for receiving data signals from said one peripheral device, and for storing data signals for transmission to the one peripheral device;

an interrupt address generator connected to said input/output port unit for generating an identification signal of said one peripheral device and an interrupt signal in response to the receipt by said input/output port unit of the external interrupt signal;

an addressable data store;

a loadable counter; and


RECEIVE
TRANSMIT
PERIPHERAL READY TO TRANSMIT
PERIPHERAL READY TO RECEIVE
INTERRUPT SIGNAL RECEIVED BY I/O PORT
INTERRUPT TO IAG
IAG GENERATES INT. SIGNAL TO IOE
IAG GENERATES ID PERIPHERAL TO IOE
IOE GENERATES CLOCK SIGNALS FOR Q COUNTER
IOE LOADS START SIGNAL COUNT IN Q COUNTER
Q COUNTER = ZERO
START SIGNAL RECD
NO
YES
IOE ACTIVATES I/O PORT TO TRANSMIT START SIGNAL
(TO FIG 5A)


(FROM FIG 5A)
IOE LOADS DATA SIGNAL COUNT IN Q-COUNTER
Q-COUNTER=ZERO
Q-INT. SIGNAL TO IAG
INT. SIGNAL TO IOE
IOE ACTIVATES I/O PORT TO SAMPLE RECEIVED SIGNAL AND TO STORE BIT
IOE ACTIVATES I/O PORT TO TRANSMIT NEXT BIT
STOP BIT
YES
NO
END

an instruction decode and execution unit connected to receive identification and internal interrupt signals and responsive thereto to access said data store to retrieve a number stored in an address location according to the identification signal and the mode of communication, and to transfer said retrieved number into said counter and activate said counter;

said counter being coupled for actuation of said interrupt address generator upon attaining a specified count to generate subsequent internal interrupt signals;

said instruction decode and execution unit being coupled to actuate said input/output port unit to receive the data signals on a receive communication in response to the subsequent internal interrupt signals or to transmit the stored data signals in response to all internal interrupt signals.

3,953,836

ACOUSTIC STORAGE DEVICE FOR HIGH-FREQUENCY ELECTRICAL SIGNALS

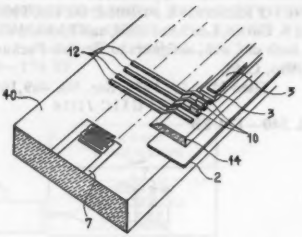
Gerard Kantorowicz, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 13, 1974, Ser. No. 532,597

Claims priority, application France, Dec. 18, 1973, 73.45234

Int. Cl.² G11C *21/02, 11/22*

U.S. Cl. 340—173 MS 5 Claims



1. An electro-acoustic storage device for high-frequency signals, constituted by a network of units each made up of a capacitor and a semi-conductor diode in series with one another, said diode being composed of an insulated electrode applied to one of the faces of a semi-conductive substrate and arranged between two electrodes the first of which is applied directly upon that face of said substrate opposite to the one on which said insulated electrode is applied, and the second of which is applied on a layer of an electrical insulating material facing said insulated electrode as well as the corresponding substrate face, said insulated electrode and said second electrode constituting the electrodes of said capacitor, characterised in that it comprises, furthermore, a piezo-electric substance and an input transducer applied upon one of the faces of said substance, to the terminals of which transducer there are applied the signals; in that said insulated electrodes of said network of diodes are distributed in the direction of propagation of the surface acoustic waves generated by said transducer on the face of said piezo-electric substance; and in that it comprises means for coupling that face of said piezo-electric substance at which said acoustic waves propagate, with said insulated electrodes of said diodes of the network, as well as means for alternately applying between said electrodes of each capacitor, a voltage pulse to charge said capacitor up and a voltage pulse of opposite direction in order to cause it to discharge by avalanche effect across said diode, said discharge producing at the terminals of a transducer applied upon the same face of the piezo-electric substance as before, read-out of the signal stored in each of the diodes at the time of charging of the capacitor.

3,953,837

DUAL SERIAL-PARALLEL-SERIAL ANALOG MEMORY

Tom F. Cheek, Jr., Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 27, 1974, Ser. No. 527,670

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R 14 Claims

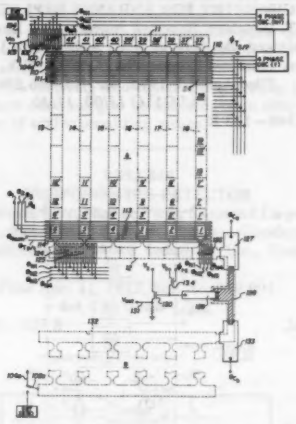
1. Charge transfer device signal processing apparatus for handling time sampled analog input signals, comprising:

first and second charge transfer device shift registers each including:

a. a serial input channel and a serial output channel connected to said input channel by a plurality of parallel channels wherein all said channels are formed in a semiconductor body,

b. separate arrays of multi electrode sets of phase electrodes insulated from and overlying said input, parallel and output channels,

c. an output transfer electrode common to all of the parallel channels of that shift register;



means for inputting time samples of said input signals alternately to the input channels of each of said first and second shift registers; and

said serial output channels of the first and second shift registers including means operable to multiplex outputs from said output channels.

3,953,838

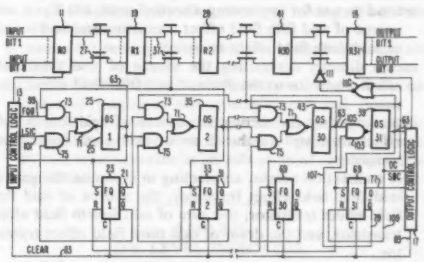
FIFO BUFFER REGISTER MEMORY UTILIZING A ONE-SHOT DATA TRANSFER SYSTEM

Robert Charles Gilberg, Escondido, and Frank Chung-Yai Young, Santa Clara, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 30, 1974, Ser. No. 537,680

Int. Cl.² G11C *19/00, 11/24;* H03K *25/02*

U.S. Cl. 340—173 R 13 Claims



1. A FIFO register memory for temporarily storing data words comprising:

input means including a multi-bit input register for reading data words into the memory;

output means including a multi-bit output register for reading data words out of the memory;

a plurality of multi-bit registers interposing said input register and said output register;

gating means interconnecting said plurality of registers for permitting the transfer of a data word in parallel register-by-register from said input register through said plurality of registers to said output register; and

control means including a plurality of one-shot devices cooperating with said gating means for automatically and asynchronously controlling the transfer of a data word from said input register to said output register.

3,953,839

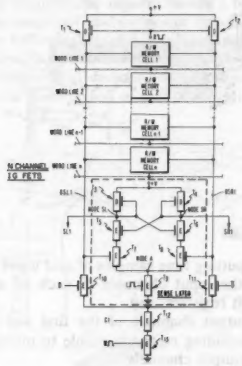
BIT CIRCUITRY FOR ENHANCE-DEPLETE RAM

Richard T. Dennison, Hopewell Junction, and David B. Eardley, Stanfordville, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 10, 1975, Ser. No. 566,896

Int. Cl.² G11C *13/00, 11/40*

U.S. Cl. 340—173 R **12 Claims**



6. A bistable latch circuit having first and second stable states of conductivity, said latch circuit comprising:

first and second depletion mode field effect transistors each having a drain, source and gate electrode;

third, fourth, fifth and sixth enhancement mode field effect transistors each having a drain, source and gate electrode;

first means for impressing a first potential V_1 on said drain of said first field effect transistor, and said drain of said second field effect transistor;

second means for impressing a second potential V_2 on said source of said fifth field effect transistor, and said source of said sixth field effect transistor;

means directly connecting the source of said third field effect transistor to the drain of said fifth field effect transistor;

means directly connecting the source of said fourth field effect transistor to the drain of said sixth field effect transistor;

first connection means, connecting in common the gate of said first field effect transistor, the source of said first field effect transistor, the gate of said fourth field effect transistor, and the drain of said third field effect transistor;

second connection means, connecting in common the gate of said second field effect transistor, the source of said second field effect transistor, the gate of said third field effect transistor, and the drain of said fourth field effect transistor;

output circuit means connected to said first connection means and to said second connection means, said output circuit means providing a first electrical manifestation when said latch circuit is in said first stable state of conductivity and a second electrical manifestation when said latch circuit is in said second stable state of conductivity;

input circuit means connected to the gate of said fifth field effect transistor and to the gate of said sixth field effect transistor, said input circuit means impressing complementary first electrical potentials, or complementary second electrical potentials, on said gates of said fifth and sixth field effect transistors, whereby said latch circuit assumes said first stable state of conductivity in response to said complementary first electrical potentials and said second stable state of conductivity in response to said complementary second electrical potentials, respectively, being impressed on said gates of said fifth and sixth field effect transistors.

3,953,840

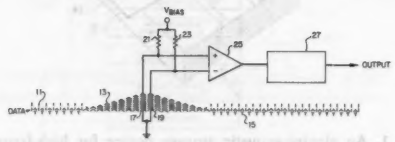
MAGNETO RESISTIVE BUBBLE DETECTION DEVICE

Leonard S. Cutler, Los Altos Hills, and Richard A. Baugh, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed May 13, 1974, Ser. No. 469,169

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 EB **9 Claims**



1. A device for detecting magnetic bubbles propagating in a stream on a magnetic wafer in response to an applied rotating magnetic field, said device comprising:

first expander means including a first plurality of magnetic elements for elongating the shape of magnetic bubbles to be detected and guiding the magnetic bubbles along a detection channel;

first and second detection means for producing a doublet electrical signal having different portions separated in time in response to an elongated magnetic bubble to be detected, said first and second detection means including a pair of adjacent elements of said first plurality of magnetic elements; and

first signal processing means electrically interconnected with said first and second detection means for comparing two voltage levels on said different portions of said doublet electrical signal and generating a data output signal whenever the difference between the two voltage levels exceeds a predetermined level.

3,953,841

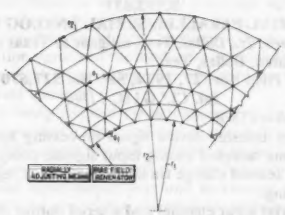
CLOSED LOOP BUBBLE LATTICE SYSTEM AND METHOD FOR STABILIZING

Otto Voegeli, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,166

Int. Cl.² G11C *11/14*

U.S. Cl. 340—174 TF **13 Claims**



1. A bubble domain lattice system adapted to provide a closed loop propagation arrangement comprising

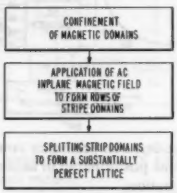
a first portion of said lattice system being curved wherein the lattice parameter increases with the radius, and

a radially varying bias field associated with said first portion wherein the strength of said field at any position occupied by a bubble domain provides an equilibrium lattice constant at said position which is substantially the same as the lattice parameter at said position.

3,953,842
BUBBLE LATTICE INITIALIZATION

Hung Liang Hu; William Albert Reynolds, Jr., and Laurence Lee Rosier, all of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 25, 1974, Ser. No. 517,990
Int. Cl.² G11C *11/14*
U.S. Cl. 340—174 TF **14 Claims**


CONFINEMENT OF MAGNETIC DOMAINS
APPLICATION OF AC INPLANE MAGNETIC FIELD TO FORM ROWS OF STRIPE DOMAINS
SPLITTING STRIP DOMAINS TO FORM A SUBSTANTIALLY PERFECT LATTICE

1. A method of providing an initial lattice of magnetic bubble domains in a film of magnetic material capable of supporting bubble domains comprising the steps of

providing said film with a confinement means adapted to contain magnetic domains within a first region of said film,

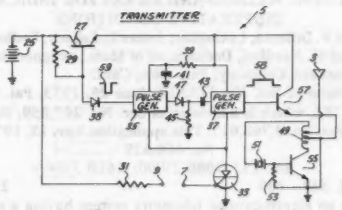
applying an AC in-plane magnetic first field to said first region, said first field being of sufficient strength to form a plurality of rows of substantially perfect parallel stripe domains, and

generating bubble domains from said stripe domains to form a substantially perfect lattice containing bubble domains.

3,953,843
SWIMMING POOL ALARM

Jorge G. Codina, Hartsdale, N.Y., assignor to General Scanning Devices, Inc., Greenwich, Conn.

Filed May 9, 1974, Ser. No. 468,237
Int. Cl.² G08B *21/00*
U.S. Cl. 340—224 **11 Claims**



1. A condition detection and alarm system comprising:

a. means for detecting a condition;

b. means connected to said detecting means for transmitting a signal of short duration in response to the detection of an occurrence of the condition, said transmitting means becoming automatically deenergized after the short transmission, said detecting and transmitting means including:

1. a transmitting means,

2. a switch being closed upon the detection of the condition,

3. means for generating a first pulse for activating a radio frequency transmitter upon closing of said switch,

4. means responsive to said first pulse generating means for generating a second pulse after said transmitter is activated,

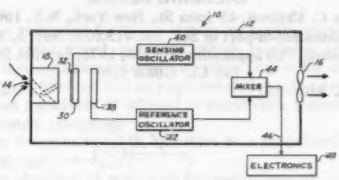
5. means connected to said second pulse generating means for stopping the flow of current to said transmitting means;

c. means for receiving said signal and activating an alarm, said alarm continuing to be activated even after de-energisation of said transmitting means.

3,953,844
INCIPIENT FIRE DETECTOR

Laurence Gibson Barr, Mission Viejo; Raymond Lu-po Chuan, Altadena, and James Fredrick Harkee, Glendora, all of Calif., assignors to Celesco Industries Inc., Costa Mesa, Calif.

Filed Apr. 11, 1973, Ser. No. 350,091
Int. Cl.² G08B *17/10*
U.S. Cl. 340—237 S **24 Claims**



1. An incipient fire detector comprising:

a. a collector for selectively collecting particulates from a fluid flowing past said collector, said collector having:

1. an outer surface, said outer surface being closed at the portion facing the direction of planned flow of said fluid, and

2. an opening formed in the outer surface portion facing opposite to the direction of planned flow,

3. said collector being sized to collect into said opening particulates having a size less than five microns and reject substantially all particulates having a size above five microns;

b. means for sensing the particulates collected by said collector;

c. means for directing said collected particulates from said collector opening to said sensing means; and

d. means responsive to the output of said sensing means for processing an increase in the mass of particulates sensed by said sensing means as an indication of an incipient fire condition.

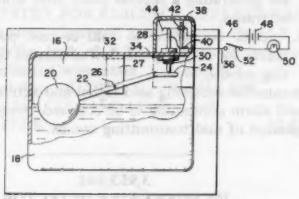
3,953,845
OIL LEVEL INDICATOR

Leonard Kress, Deer Park, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Feb. 4, 1975, Ser. No. 547,007
Int. Cl.² G08B *5/36*
U.S. Cl. 340—244 B **1 Claim**

1. An indicating apparatus for warning of an oil level below a predetermined level in an automobile crankcase which comprises: a chamber in fluid communication with the engine crankcase; an elongated arm pivotly mounted in said chamber at a point intermediate the length of said arm; a float carried at one end of said arm; a generally planar tongue formed on the other end of said arm making an angle with the longitudinal axis of the arm; a generally vertical electrically conductive

rod carried for sliding vertical movement in said chamber, said rod being unconnected to said arm but having a lower end resting on said tongue for following the movement thereof; a post disposed proximate and parallel to said rod; a contact



carried projecting from said post for engagement with an upper end of said rod; said contact being selectively adjustably positionable along said post; said contact and rod lying in a series circuit including a warning lamp.

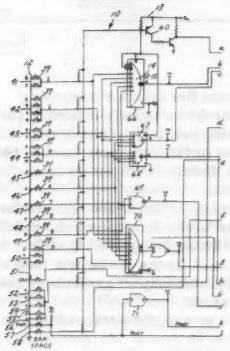
3,953,846
ENCODING DEVICE

Thomas C. Ekeland, 45 John St., New York, N.Y. 10038

Continuation-in-part of Ser. No. 413,055, Nov. 5, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,756

Int. Cl.² G08B *5/36*

U.S. Cl. 340—337 **2 Claims**



1. An encoding device for translating an input in the form of known alphabetic components of a name into an alphanumeric code in which the word is divided into phonic sounds, and assigned a decimal number in accordance with a preestablished pattern classifying the phonic sounds by the manner in which they are vocally pronounced comprising: a keyboard element including keys corresponding to the alphabet, comma and space bar; numerical signal generating means connected to said keyboard element, and generating numerical values ranging from zero to nine; the keys of said keyboard designating consonants being connected in sets to said signal generating means in accordance with said pattern; logic signal generating means for generating spacing, grouping, length of word and length of code function, the keys designating vowels, comma and space bar being connected to said signal generating means, and means for processing and displaying the outputs of said numerical and signal generating means; whereby using a predetermined maximum number of display digits, actuation of said comma and space bar keys determines the completion of insertion of first, middle and surname components and causes accounting of the same to employ available code positions to reflect each known component of an inserted name in the resultant code.

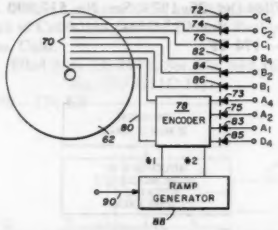
3,953,847
POSITION ENCODER

James R. Younkin, Fayetteville, and John M. Nixon, Springdale, both of Ark., assignors to Edo-Aire Mitchell Industries, Inc., Mineral Wells, Tex.

Filed Mar. 25, 1974, Ser. No. 454,306

Int. Cl.² H03K *13/18*

U.S. Cl. 340—347 AD **21 Claims**



1. A position encoder, comprising in combination:

code support means positionable in accordance with physical input information;

a first group of a plurality of code formations carried by said support means, the code formations changing at selected intervals of movement of the support means and providing switching signals;

at least one additional group of a plurality of code formations also carried by said support means, the code formations of the at least one additional group changing at selected intervals of movement of the support means;

means responsive to the code formation of the at least one additional group of code formations to provide a first series of code bit patterns varying in accordance with the input information;

means for generating a control voltage that varies in accordance with the physical input information; and

encoder logic receiving the control voltage at one input and responsive to the switching signals of the first group to provide a second series of code bit patterns varying in accordance with the input information to uniquely identify a physical input in association with the first series of code bit patterns.

3,953,848
ELECTROCARDIOGRAPH TELEMETRY SYSTEM INCLUDING METHOD AND MEANS FOR INDICATING INOPERATIVE CONDITIONS

Richard F. Dillman, Lexington; James L. Larsen, Bedford, and Alfred M. Nardizzi, Dedham, all of Mass., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 373,552, June 25, 1973, Pat. No. 3,829,782, which is a division of Ser. No. 207,859, Dec. 14, 1971, Pat. No. 3,768,017. This application Apr. 12, 1974, Ser. No. 460,629

Int. Cl.² G08B *29/00*; A61B *5/04*

U.S. Cl. 340—409 **2 Claims**

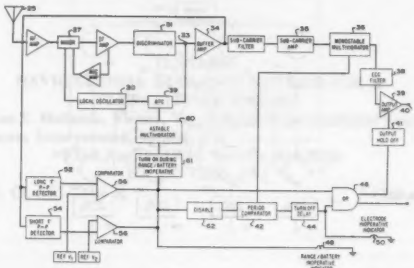
1. In an electrocardiac telemetry system having a receiver and a transmitter which transmits to the receiver a carrier signal that is modulated by a subcarrier that is modulated by electrocardiac signals applied to the transmitter from electrodes that are attached to a patient, apparatus for producing an indication that an electrode is detached from the patient comprises:

circuit means in the transmitter coupled to the electrodes for producing a control signal in response to the open circuit condition of an electrode detached from a patient;

a signal-controlled source of subcarrier signal in the transmitter having first and second subcarrier operating frequencies;

means coupled to said source for applying electrocardiac signals thereto to modulate the operating frequency thereof about the first subcarrier frequency in response to applied electrocardiac signal;

means coupling said circuit means to said source for altering the operating frequency thereof to the second subcarrier



frequency in response to control signal applied thereto from said circuit means;

carrier signal generating means coupled to said source for transmitting a carrier signal modulated by said subcarrier signal;

receiver means including a detector responsive to transmitted carrier signal modulated at said second subcarrier frequency received by the receiver means for producing an output that is indicative of electrode detachment from a patient.

3,953,849

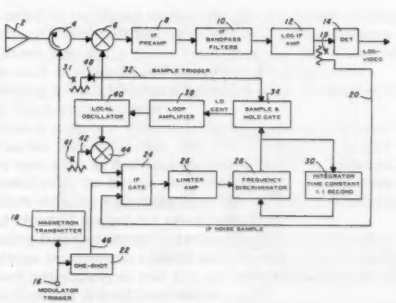
AUTOMATICALLY CENTERED PULSED RADAR RECEIVER

James B. Couvillon, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 6, 1974, Ser. No. 495,163

Int. Cl.² G01S 9/02

U.S. Cl. 343—7 A **6 Claims**



2. A pulsed non-coherent radar system comprising:

transmitter means for transmitting RF pulses towards a target,

receiver means for receiving RF pulses reflected from a target and for generating an IF signal in response thereto,

an electronically tunable frequency reference,

a frequency discriminator coupled to the transmitter, the receiver, and the frequency reference for tuning the frequency reference to the frequency of the receiver thermal noise output and for maintaining the receiver IF at said noise frequency.

3,953,850

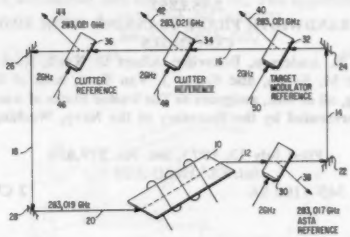
RADAR TEST FACILITY COMMUNICATION SYSTEM

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 8, 1974, Ser. No. 513,019

Int. Cl.² G01S 7/04

U.S. Cl. 343—17.7 **18 Claims**



1. In a radar test facility, a system for communicating between a radar target generator which produces electrical signals that simulate dynamic and static targets for insertion into radars under test and an angle simulation test array which comprises a plurality of infrared to microwave, transponders, which system comprises:

means for generating IR radiation in a predefined closed path; and

means disposed in said path for gating said IR radiation towards said test array.

3,953,851

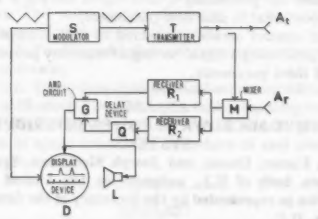
DEVICE FOR A RADIO STATION COMPRISING A JAMMER

Eskil Weidstam, Banergatan 55, Stockholm, Sweden

Continuation-in-part of Ser. No. 690,709, Dec. 8, 1967, abandoned. This application Mar. 17, 1970, Ser. No. 24,912

Int. Cl.² G01S 7/38; H04K 3/00

U.S. Cl. 343—18 E **2 Claims**



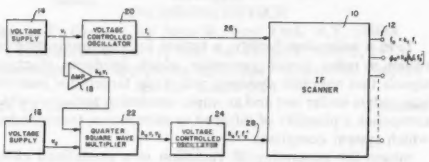
1. An arrangement at a radio station including a frequency modulated transmitter unit for jamming, a receiver unit for the reception of externally generated signals and a mixer preceding the receiver unit, the one input of the mixer being connected to a receiver antenna circuit and the second input to the output circuit of the transmitter unit, the carrier of which is frequency modulated according to an arbitrary function of time, said receiver unit is tuned to receive a frequency including side bands which lies within one range of beat frequencies produced by the mixer, varying in dependence of the transmitter unit modulation wave, an indicating device indicating the presence of output signals of the receiver unit in dependence of carrier frequencies received which lie within essentially the

range of frequencies transmitted by the transmitter unit, said receiver unit including two receivers tuned to different frequencies the inputs of the receivers are fed by the mixer in parallel the output of the one receiver is connected to the one input of an AND circuit the output of which is connected to the display device or electroacoustic device, and the output of the second receiver is connected to second input of the AND circuit via a time delay circuit which provides a time delay equal to the time interval between two successive output pulses delivered in turn by the two receivers in dependence of one received signal, the AND circuit being such that it passes coinciding pulses.

3,953,852
WIDE BANDWIDTH PHASE SCANNING WITH SIMPLE CONTROLS

Wallace E. Anderson, Beltsville; Albert D. Krall, Rockville; Albert M. Syeles, and Oscar J. Van Sant, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 13, 1973, Ser. No. 379,859
Int. Cl.² H01Q 3/26
U.S. Cl. 343—100 SA **2 Claims**



1. A device for generating signals for an IF scanner used to electronically steer a phased array antenna comprising:

first signal generating means for generating a signal having a first parameter;

second signal generating means for generating a second signal having a second parameter;

multiplier means connected to said first and said second signal generating means for producing a signal having a third parameter which is some multiple of said first and said second parameters;

first control means connected to said first signal generating means for generating a first signal having a frequency proportional to said first parameter;

second control means connected to said multiplier means for generating a signal having a frequency proportional to said third parameter.

3,953,853
PASSIVE MICROWAVE POWER DISTRIBUTION SYSTEMS

John L. Carter, Ocean, and Joseph McGowan, Spring Lake Heights, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 25, 1974, Ser. No. 482,946
Int. Cl.² H01Q 3/26
U.S. Cl. 343—100 SA **5 Claims**

4. A microwave power distribution system comprising:

four four-port circulators

a dummy load connected to the fourth port of each of the four circulators,

means connected to the third port of each of the four four-port circulators for delivering microwave power to respective microwave loads,

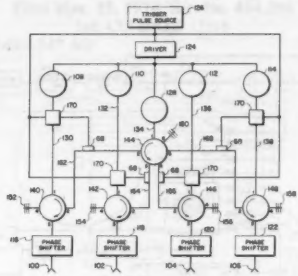
a standby circulator means having two four-port circulators coupled together to provide six ports,

a dummy load connected to the sixth port of the standby circulator means,

four waveguide means, each including waveguide switch means, coupling the second port of each four-port circulator to the second through fifth ports respectively of the standby circulator means,

four input waveguide means coupled to the first port of each of the four circulators respectively,

an input waveguide means coupled to the first port of the standby circulator means,

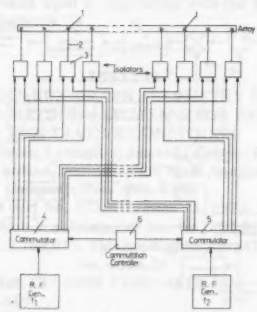


a two input, one output logic means and a power monitoring means for each of the four waveguide means, one of the two inputs being for connection to a trigger pulse source for initiating power into the four input waveguide means, and the other of the two inputs being coupled to the monitoring means and the one output being coupled to the waveguide switch means that is in circuit with the respective four-port circulator.

3,953,854
DOPPLER RADIO NAVIGATION BEACON SYSTEM WITH MEANS FOR REDUCING MULTIPATH SIGNAL EFFECTS

Francis G. Overbury, Cuffley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed June 17, 1974, Ser. No. 479,770
Claims priority, application United Kingdom, June 21, 1973, 29502/73
Int. Cl.² G01S 1/40
U.S. Cl. 343—106 D **5 Claims**



1. In a radio navigation beacon of the Doppler type including a linear array having a plurality of substantially uniformly spaced, separately excitable, radiating elements, the combination comprising:

radio frequency generators for producing unmodulated, substantially frequency constant f_1 and f_2 excitation signals differing from each other by a predetermined fixed amount;

a first commutator for applying said f_1 unmodulated signal to a contigous fraction of said array elements successively in a first directional sense;

a second commutator for applying said unmodulated f_2 signal to said contiguous fraction of said array elements successively in a second directional sense; and

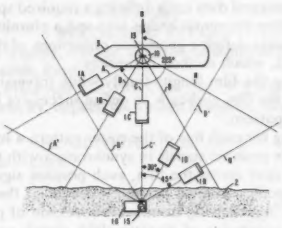
programming means for controlling said first and second commutators to provide substantially synchronous commutation such that each of said commutators completes a cycle of commutation including the same number of elements of said array in substantially the same time.

3,953,855

NAVIGATIONAL GUIDANCE METHOD FOR A PLURALITY OF VESSELS

Brian E. Hollands, Vienna, Va., assignor to International Engineers Incorporated, Vienna, Va.

Filed Aug. 5, 1974, Ser. No. 494,983
Int. Cl.² G01S 1/44
U.S. Cl. 343—106 R **3 Claims**



1. A collision avoidance method for simultaneously guiding a plurality of water craft through water along different preassigned lanes between a water-borne location and a second location such as a beachhead comprising the steps of:

positioning a first VHF omnidirectional-range transmitter at the water-borne location;

positioning a second VHF omnidirectional-range transmitter at the second location, said first and second transmitters operating at first and second different frequencies, respectively, the signals generated by each of said transmitters defining a plurality of radials diverging therefrom and directed toward the other transmitter;

providing first and second directional VHF omnidirectional-range receivers on each of said plurality of water craft tuned respectively to said first and second frequencies of said first and second transmitters; and

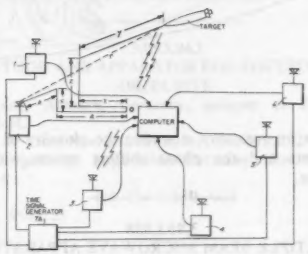
simultaneously guiding each of said plurality of water craft through the water along a unique one of said preassigned lanes, a different one of said lanes being preassigned for each water craft, each of said preassigned lanes consisting of the continuous path defined by a unique pair of intersecting radials from amongst said plurality of radials, one radial of each of said pair of radials emanating from said first transmitter, the other radial of each of said pair of radials emanating from said second transmitter, whereby collision between two water craft is prevented.

3,953,856

METHOD AND APPARATUS FOR MAPPING AND SIMILAR APPLICATIONS

Calvin Miles Hammack, P.O. Box 302, Saratoga, Calif. 95070

Continuation-in-part of Ser. Nos. 296,321, Oct. 10, 1972, and Ser. No. 288,429, Sept. 19, 1972, Pat. No. 3,866,229, and Ser. No. 74,180, Sept. 21, 1970, Pat. No. 3,795,911, said Ser. No. 296,321, is a continuation-in-part of Ser. No. 86,770, Feb. 2, 1961, Pat. No. 3,706,096, said Ser. No. 288,429, is a continuation-in-part of Ser. No. 817,765, April 21, 1969, Pat. No. 3,691,560, which is a continuation-in-part of Ser. No. 420,623, Dec. 23, 1964, Pat. No. 3,445,847, said Ser. No. 74,180, is a continuation-in-part of Ser. No. 278,191, May 6, 1963, abandoned, and Ser. No. 86,770,. This application Mar. 4, 1974, Ser. No. 448,071
Int. Cl.² G01S 3/02
U.S. Cl. 343—112 D **49 Claims**



1. A method of determining the unknown position of each of a plurality of points in space relative to the others of said plurality of points comprising the following elements:

Element 1. Establishing a wave station at each of said plurality of points in space;

Element 2. Providing a moving means for travel in continuously unknown motion relative to said unknown positions moving along a continuously unknown path with a continuously unknown velocity;

Element 3. Transmitting waves in the spaces between said wave stations and said means for travel;

Element 4. Using doppler measuring means generating the physical representations of quantities linearly dependent upon the variations of the simultaneously existing unknown and unmeasured distances between said wave stations and said means for travel;

Element 5. Feeding said physical representations into computing means;

Element 6. Using only said physical representations generated in Element 4 computing in said computing means the otherwise unknown position of each of said plurality of points in space relative to the others of said plurality of points in space.

3,953,857

AIRBORNE MULTI-MODE RADIATING AND RECEIVING SYSTEM

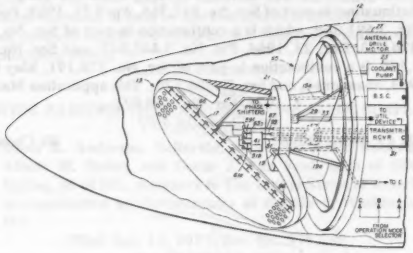
Frederic A. Jenks, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Mar. 7, 1972, Ser. No. 232,366
Int. Cl. H01q 1/28; 3/26
U.S. Cl. 343—705 **8 Claims**

1. In directional antenna apparatus for use in a streamlined radome on an aircraft, such radome being ogival in shape, the improvement comprising the combination of:

a. a plurality of antenna elements, such elements being disposed in a planar array within a substantially elliptical outline corresponding to a diagonal section of the radome;

b. phase shifting means, operative on radio frequency energy passing to and from each one of the antenna elements, for collimating such energy into a beam and for deflecting such beam; and,



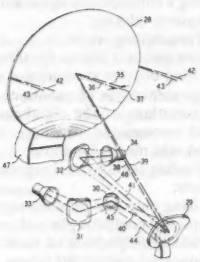
c. means for rotatably mounting the plurality of antenna elements and the phase shifting means within the radome.

3,953,858

MULTIPLE BEAM MICROWAVE APPARATUS

Edward Allen Ohm, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 30, 1975, Ser. No. 582,103
Int. Cl.² H01Q 19/14
U.S. Cl. 343—779 **13 Claims**



1. A multiple beam microwave antenna comprising

an essentially paraboloidal main reflector having an aperture;

a convex subreflector located outside said aperture so that a first and second microwave beam centered upon said main reflector overlap between said main reflector and said subreflector and are reflected to and are parted at a focus outside said aperture, said first and second beams respectively having a confocal parameter length;

first and second feed horn means; and

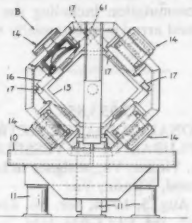
a deflector placed in said first beam within its confocal parameter length so as to deflect said first beam to said first feed horn means; said second feed horn means being positioned so as to receive said second beam.

3,953,859

METHOD AND APPARATUS FOR RECORDING LATENT PHOTOGRAPHIC IMAGES

John W. Locke, Toronto, Canada, assignor to The Governing Council of the University of Toronto, Downsview, Canada

Filed Oct. 25, 1974, Ser. No. 517,959
Int. Cl.² G01D 9/42
U.S. Cl. 346—1 **11 Claims**



1. A method of recording latent photographic images on film by scanning the film in a raster pattern with a spot produced by focusing onto the film a beam of radiation which is modulated in accordance with the retrieval of pictorial data defining an image to be recorded, the data comprising a plurality of elemental data each defining a required spot intensity at a respective elemental image area and a plurality of sets of corrective data defining geometric distortions of the image to be recorded, which method comprises:

advancing the film longitudinally while traversing the spot across the film cyclically to define successive lines of said raster pattern,

producing for each line of the raster pattern a succession of discrete position signals in synchronism with the traverse of the spot across the film, each position signal defining a respective nominal position element of the respective raster line, deriving from said succession of position signals a succession of discrete clock signals each defining a respective elemental image area, retrieving said elemental data successively in response to the derivation of said clock signals,

varying the rate of derivation of said clock signals in relation to the production of said position signals in accordance with a first set of said corrective data,

varying the rate of film advance in accordance with a second set of said corrective data,

varying the direction of film advance in relation to a nominal longitudinal direction in accordance with a third set of said corrective data, and

modulating the beam in accordance with the retrieved data so as to set the spot intensity at the required level for each successive elemental image area as corrected by said corrective data.

3,953,860

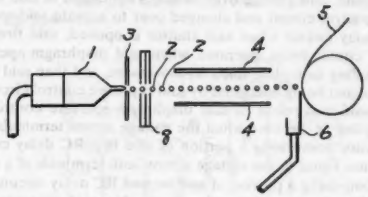
CHARGE AMPLITUDE DETECTION FOR INK JET SYSTEM PRINTER

Isao Fujimoto, Kunitachi; Takeshi Kasubuchi, and Masahiko Aiba, both of Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Mar. 12, 1974, Ser. No. 450,414
Claims priority, application Japan, Mar. 12, 1973, 48-28686
Int. Cl.² G01D 15/18
U.S. Cl. 346—75 **2 Claims**

1. A charge amplitude detector unit for an ink jet system printer comprising two electrically insulating plates each having first and second major surfaces and provided with openings extending through said surfaces in corresponding posi-

tions, said openings being aligned for the passage of ink drops therethrough, a detecting electrode disposed between the first major surfaces of the two insulating plates, and having a corresponding opening defined therethrough in registry with said openings in said plates, said opening being dimensioned such that the amplitude of charges on ink drops passing through said openings induces charge amplitude detection signals in



said detecting electrode by electrostatic induction occurring upon the passing of said ink drop through said openings, shielding electrodes on said second major surfaces surrounding said openings, and a pair of signal wires connected to the detecting electrode and one of the two shielding electrodes, respectively, for transmitting said electrostatically induced charged amplitude detection signals from said detection unit.

3,953,861

RECORDING STYLUS

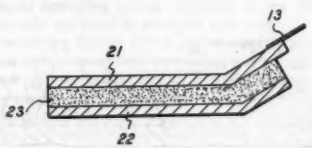
Barry John Kipling, Hitchin, England, assignor to Rank Xerox, Ltd., London, England

Filed Apr. 30, 1975, Ser. No. 572,978

Claims priority, application United Kingdom, May 29, 1974, 23746/74

Int. Cl.² G01D *15/00, 11/10*

U.S. Cl. 346—139 C **5 Claims**



1. A recording stylus comprising the combination of

a first metal blade having a stem portion and an angulated end portion,

a stylus point secured to and extending beyond the end portion of said first blade,

a second metal blade having a stem portion and an angulated end portion aligned with the stem portion and the end portion, respectively, of said first blade,

a resilient member disposed between and adhesively bonded to said first and second blades, said resilient member at least partially extending along both the stem portion and the end portion of each of said blades to conteract any tendency of said stylus to oscillate.

3,953,862

PRINTING HEAD DEVICE FOR AN INK JET PRINTER

Jan Roger Amberntsson; Roger Ingemar Andersson, both of Angered, and Stig Bertil Sultan, Floda, all of Sweden, assignors to Facit Aktiebolag, Atvidaberg, Sweden

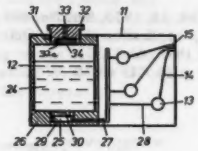
Filed Dec. 26, 1974, Ser. No. 536,606

Claims priority, application Sweden, Dec. 28, 1973, 7317524

Int. Cl.² G01D *15/16*

U.S. Cl. 346—140 R **5 Claims**

1. In a printing head device for an ink jet printer the improvement comprising: a liquid reservoir for said ink supply associated with said printing head and movable therewith and provided with an air inlet opening, and a filter in said opening



being constituted of a material that permits the passage of air but prevents the flow of liquid therethrough.

3,953,863

METHOD AND APPARATUS FOR FOCUSING AN OBJECTIVE

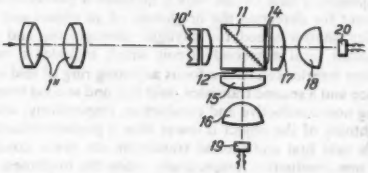
Karl Lang, Atzbach, Germany, assignor to Ernst Leitz G.m.b.H.

Filed Nov. 27, 1973, Ser. No. 419,282

Claims priority, application Germany, Dec. 11, 1972, 2260474

Int. Cl.² G03B *3/10*

U.S. Cl. 354—25 **6 Claims**



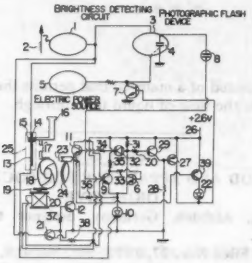
3. A system comprising an objective with an optical axis and an entrance pupil, said objective being adjustable for focusing an object image in a plane along said optical axis, ray splitting optical elements mounted in said image plane selecting light fluxes from different parts of said entrance pupil, first and second photoelectric receiver means receiving said light fluxes from said different part of said entrance pupil and generating output signals depending on the amount of light received, means for comparing said output signals and generating a comparison signal and means responsive to said comparison signal for focusing said objective according to magnitude and sign of said comparison signal.

4. The system of claim 3, further comprising a beam splitter (11) located along said optical axis producing together with a field lens and said ray splitting optical elements on respectively each exit surface of the splitter, two spatially separate double images of said entrance pupil in spatially separate planes corresponding to said first and second photoelectric receiver means, said two spatially separate double images having first and second separate axes, first and second stops 12, 14 located along said first and second separate axes at said double images, said stops being matched to the geometrical form of said image splitting elements and having apertures corresponding respectively to the paraxial part of said entrance pupil and to the complementary part of said entrance pupil, and one objective and one condensing lens each located along said first and second separate double image axes for collimating the light fluxes passing said apertures onto said receiver means.

3,953,864
CAMERA DEVICE HAVING A PHOTOGRAPHIC FLASH DEVICE COMBINED THEREWITH

Hiroshi Iwata, Osaka, and Satoru Misaki, Toyonaka, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Filed Oct. 23, 1973, Ser. No. 408,530
Claims priority, application Japan, Oct. 23, 1972, 47-106502; Mar. 20, 1973, 48-32332
Int. Cl.² G03B 7/16
U.S. Cl. 354—27 6 Claims

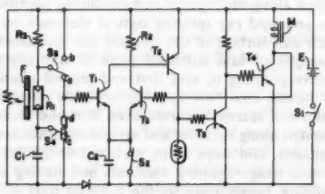


6. A camera device having a photographic flash device combined therewith including automatic switching circuitry for automatically switching between daylight photography and electronic flash photography depending on film speed and the brightness of an object, said automatic switching circuitry comprising a first circuit which includes a photoconductive element for detecting the brightness of an object and determining shutter speed for daylight photography and a first transistor, and a second circuit which includes a variable resistor interlocked with a focus adjusting ring of said camera device and a second transistor, said first and second transistors being non-conductive and conductive, respectively, when the brightness of the object is lower than a predetermined value while said first and second transistors are made conductive and non-conductive, respectively, when the brightness of the object is higher than said predetermined value, thereby daylight photography and electronic flash photography being automatically switched depending on film speed and the brightness of said object.

3,953,865
ELECTRIC SHUTTER

Kunio Matsumoto, Ageo, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Nov. 12, 1974, Ser. No. 523,120
Claims priority, application Japan, Nov. 15, 1973, 48-128585; May 4, 1974, 49-50041
Int. Cl.² G03B 7/14
U.S. Cl. 354—29 6 Claims

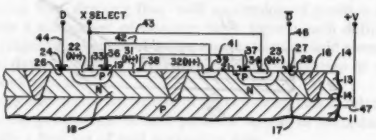


1. An electric shutter comprising a diaphragmaperture controlling cam plate, a mechanical delay means engaged with said diaphragm-aperture controlling cam plate to delay the movement of said cam plate, an armature lever engageable with said mechanical delay means, an armature rotatably supported by said armature lever, an electromagnet facing said armature and arranged so as to be able to attract said armature, an exposure control circuit connected to said electromagnet and having therein a first RC delay circuit for controlling the diaphragm aperture and a second RC delay circuit for controlling the exposure time, diaphragm blades operatively connected to said diaphragm aperture controlling cam plate, and change-over switches contained in said exposure control circuit and changed over to actuate said second RC delay circuit when said shutter is opened, said first RC delay circuit being operated when said diaphragm-aperture controlling cam plate starts its movement, and then said electro-magnet being energized by said exposure control circuit to stop said movement of said diaphragm-aperture controlling cam plate at the time when the voltage across terminals of a capacitor comprising a portion of said first RC delay circuit becomes equal to the voltage across both terminals of a resistor comprising a portion of said second RC delay circuit; and said electro-magnet being de-energized by said exposure control circuit to close said shutter at the time when the voltage across terminals of the capacitor of said first delay circuit becomes equal to the voltage across terminals of said capacitor of said second delay circuit.

3,953,866
CROSS COUPLED SEMICONDUCTOR MEMORY CELL

Lewis K. Russell, San Jose, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed May 10, 1974, Ser. No. 468,938
Int. Cl.² H01L 27/02, 27/04; H03K 5/00, 3/26
U.S. Cl. 357—44 8 Claims



1. In a semiconductor memory cell, a one conductivity semiconductor body having a major surface, an opposite conductivity layer formed on said major surface, said layer having a planar surface, means extending from said planar surface through said layer to contact said body for isolating portions of said layer into first and second device regions, said first and second device regions each including a one conductivity region formed in said device region and extending to said planar surface, including an opposite conductivity region formed within said one conductivity region and extending to said surface, and including a first rectifying metal-to-semiconductor contact carried by said device region at said planar surface, lead means having means for ohmic interconnection of each said opposite conductivity region formed in said one conductivity region, means for interconnection of said first device region and said one conductivity region formed in said second device region and means for interconnection of said second device region and said one conductivity region formed in said first device region and additional lead means for coupling said first metal-to-semiconductor contacts, said semiconductor body and said interconnected opposite conductivity regions to external circuitry.

3,953,867
ELECTROMAGNETIC OPERATING CIRCUIT FOR CAMERAS

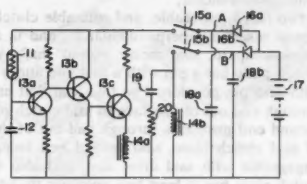
Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Tokyo, Japan and Fuji Photo Film Co., Ltd., Japan

Filed Mar. 13, 1975, Ser. No. 557,987

Claims priority, application Japan, Mar. 16, 1974, 49-30261

Int. Cl.² G03B *7/08, 9/62, 9/64*

U.S. Cl. 354—51 **8 Claims**



1. An electromagnetic operating circuit for a camera comprising in combination;

a direct current power source,

a plurality of capacitors connected in parallel with said power source to be charged thereby,

a plurality of electromagnetic coils,

each of said coils being connected with at least one of said capacitors to be energized by the discharge current of the capacitor connected therewith,

at least one delay circuit connected with at least one of said coils for delaying the energization of the coil,

a plurality of normally opened switching means one of which is connected between each said coil and said capacitors connected therewith,

a manual operating means provided in the camera to be manually operated to energize said coils,

said switching means being closed to energize said coils upon operation of said manual operating means, and

at least one diode connected between said capacitors for preventing current dicharged from one capacitor from flowing into the coil connected with another capacitor when said switching means is closed.

3,953,868
DEVICE FOR RECORDING CAMERA DATA

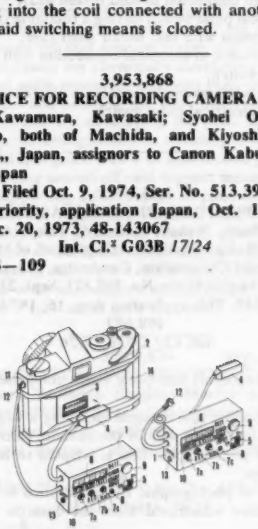
Tomoaki Kawamura, Kawasaki; Syohei Ohtaki; Soichi Nakamoto, both of Machida, and Kiyoshi Takahashi, Kunitachi,, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 9, 1974, Ser. No. 513,395

Claims priority, application Japan, Oct. 15, 1973, 48-115490; Dec. 20, 1973, 48-143067

Int. Cl.² G03B *17/24*

U.S. Cl. 354—109 **6 Claims**



1. A camera data recording device comprising:

a camera body containing film therein;

a data control device provided separately from said camera body, said control device including data selecting means and data setting means;

solid-state illuminating means being provided at the back of said film within the camera; and

a connecting element for connecting the control device to the illuminating means in said camera body,

said illuminating means being controlled by control signals from the data setting means for recording the digital data on the film within the camera.

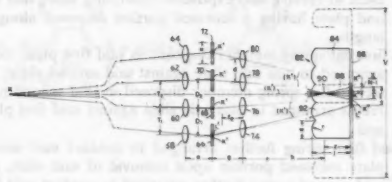
3,953,869
STEREOSCOPIC PHOTOGRAPHY APPARATUS

Allen Kwok Wah Lo, Atlanta, and Jerry Curtis Nims, Dunwoody, both of Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Filed Sept. 24, 1974, Ser. No. 508,823

Int. Cl.² G03B *35/08*

U.S. Cl. 354—115 **21 Claims**



1. A system for producing stereoscopic pictures, comprising:

a camera for recording a plurality N of two-dimensional views of an object field, said camera including a corresponding plurality N of lenses aligned in a straight path with their optical axes substantially equidistantly spaced apart and substantially in parallel and film support means for positioning unexposed film in image-recording relation to said N lenses;

means in said camera for adjusting the spacing between the optical axes of adjacent lenses as a function of the distance from said lenses to a selected element of the object field to maintain the image of said selected object field element formed by each lens at substantially the same predetermined location on the associated two-dimensional view;

means for projecting respective ones of the two-dimensional views from a corresponding plurality N of predetermined projecting lens locations, with the projected image from each two-dimensional view of said selected object field element in substantial registry with a predetermined reference point, said projecting lens locations being aligned in a straight path and substantially equidistantly spaced apart by a distance which is related by a substantially constant factor to the distance between said image locations on adjacent two-dimensional views;

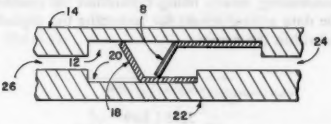
a lenticular screen of lenticule width *w* positioned opposite said projection locations with a lenticule thereof in substantial alignment with said reference point; and

a photosensitive surface positioned at the rear face of said lenticular screen.

3,953,870
LIGHT TRAP

David Owen Stolper, 105 Winchester St., Apt. 3, Brookline, Mass. 02146

Filed Mar. 25, 1975, Ser. No. 561,883
Int. Cl.² G03B 17/26
U.S. Cl. 354—277 4 Claims



1. In a photographic film pack adapter for cameras comprising a frame and exposure-controlling slide slideably mounted between two longitudinal edges thereof, a light trap for preventing light from entering said frame through a transverse edge thereof, said light trap comprising in combination:

a first plate mounted in said frame along said transverse edge, said plate having a recessed portion disposed along its length;

a second plate mounted in said frame parallel to said first plate spaced apart from said first plate a distance sufficient to receive said exposure-controlling slide, said second plate having a recessed portion disposed along its length;

a first flat spring member disposed in said first plate recess arranged to bias said slide against said second plate;

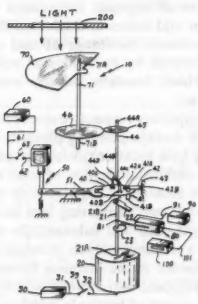
a second flat spring member disposed in said second plate recess arranged to bias said slide against said first plate; and

said first spring further arranged to contact said second plate recessed portion upon removal of said slide, and said second spring further arranged to contact said first plate recessed portion upon removal of said slide.

3,953,871
PRECISION LIGHT EXPOSURE TIMING AND SHUTTER MECHANISM FOR A WIDE RANGE OF EXPOSURE DURATIONS

David C. Borchard, Rochester; Robert E. Chan, Scottsville, and Neil F. Ratzel, Rochester, all of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 20, 1974, Ser. No. 535,066
Int. Cl.² G03B 9/08
U.S. Cl. 354—252 4 Claims



1. A precision light exposure timing and shutter mechanism suitable for a wide range of exposure durations, adapted for use with a stationary aperture of known size, comprising:

a. a synchronous motor having an output shaft with a first end and a second end, wherein said first end is connected to said synchronous motor and said second end is connected to a drive arm, and wherein said output shaft has an appropriately configurated and dimensioned cam mounted thereon at a suitable location between said first and said second ends;

b. a source of voltage of well-regulated frequency in electrical connection with said synchronous motor, and with a switch interposed between said source of voltage and said synchronous motor;

c. a two-faced, moveable, and rotatable clutch plate positioned essentially perpendicular to, and in spaced-apart relationship to, said motor output shaft, wherein said clutch plate has a pin with a first end and a second end, with said pin positioned so that said first end protrudes through and out of one face of said clutch plate and said second end protrudes through and out of the other face of said clutch plate, said second end being selectively engageable with said drive arm, and also wherein said clutch plate has at least two openings therethrough;

d. a stop arm having a first end and a second end, with said first end attached to an abutment, and with said second end selectively abutable with said first end of said clutch plate pin;

e. a solenoid having a moveable arm which is engaged with said clutch plate;

f. a voltage source in electrical connection with said solenoid, and with a switch interposed between said voltage source and said solenoid;

g. a clutch plate shaft having a first end and a second end, with said first end connected to a driver gear of a preselected diameter, and with said second end having a terminus with a plurality of ends equal in number to, and engaged with, the said openings in said clutch plate;

h. a driven gear abutting with, and driveable by, said driver gear, wherein said driven gear has a diameter equal to twice the preselected diameter of said driver gear;

i. a shutter of the disc-type having an open sector and positioned essentially above said driven gear, which said open sector being of a size larger than the stationary aperture;

j. a shutter shaft having a first end and a second end, with said first end connected to said shutter, and with said second end connected to said driven gear;

k. an electrical pulse switch having a rotatable cam follower in engagement with said motor shaft cam;

l. a voltage source in electrical connection with said electrical pulse switch;

m. and, an electromagnetic counter in electrical connection with said electrical pulse switch.

3,953,872
NOVEL PHOTOGRAPHIC FILM ASSEMBLIES

Stanley M. Bloom, Waban; James W. Foley, Andover, and Nicholas S. Hadzekyriakides, Arlington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 399,321, Sept. 21, 1973, Pat. No. 3,877,045. This application Aug. 16, 1974, Ser. No. 498,057
Int. Cl.² G03B 17/26
U.S. Cl. 354—275 17 Claims

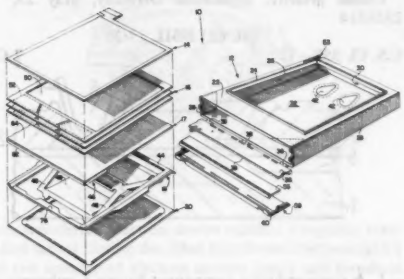
1. In a photographic film pack which comprises, in combination:

a. a photographic film cassette including a withdrawal orifice positioned in a wall of the cassette through which a supply of photographic film is adapted to be selectively withdrawn;

b. a supply of photographic film positioned in the cassette for selective withdrawal from the cassette through the orifice;

c. a battery positioned in the cassette and including, in combination:

i. an anode;
ii. a cathode superposed substantially coextensive the anode;
iii. a battery separator positioned intermediate and extending at least coextensive the facing surfaces of the anode and the cathode; and



iv. an electrolyte disposed in contact with the facing surfaces of the anode and the cathode and including an ammonium salt; the improvement comprising gas collector means positioned in the cassette for capture of volatile effluvia exiting from the battery and wherein said collector consists essentially of an absorbent carbon.

3,953,873

AUTOMATIC CAMERA FOR DUAL PRINTING PLATES

John H. Tholen, St. Paul, and John C. Winters, Birchwood Village, both of Minn., assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Nov. 13, 1974, Ser. No. 523,420
Int. Cl.² G03D 17/00
U.S. Cl. 354—315 8 Claims

7. A printing plate developing machine comprising support means for supporting a sheet of light-sensitive plate material in exposing position, means for transporting the plate material to said support means and for moving said plate material off said support means, a first guide means for receiving plate material moved off said support means and directing it to a chemical processor for chemically developing plate material and a second guide means for receiving plate material off said support means and directing the plate material to an electrographic processor for developing the plate material with a toner powder, diverting means for directing said plate material to one of said first guide means or said second guide means as the same is being moved off said support means, first holding means for supporting a first supply of plate material, second holding means for supporting a second supply of a different plate material, drive means for drawing plate material from said first supply or from said second supply, cutting means for cutting a length of drawn plate material, and means for placing said material onto said support means in said exposing position to cover a substantial area thereof.

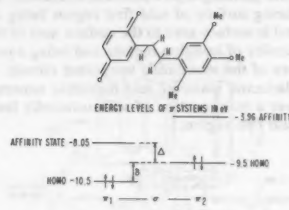
3,953,874

ORGANIC ELECTRONIC RECTIFYING DEVICES

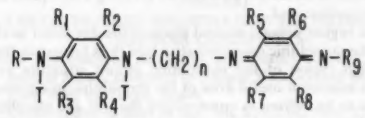
Arieh Aviram, Yorktown Heights; Marvin Joseph Freiser, Scarborough; Philip Edward Seiden, Briarcliff Manor, and William Robert Young, Millwood, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 12, 1974, Ser. No. 450,541
Int. Cl.² H01L 29/28
U.S. Cl. 357—8 5 Claims

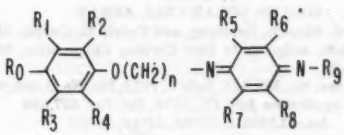
1. An organic electronic device comprising:
a substrate;
a first conductive metal layer on said substrate adapted to have an electrical contact made thereto;



a layer of a compound on said first metal layer selected from the group consisting of:



, and



wherein any or all or the pairs, R_1 and R_2, R_3 and R_4, R_5 and R_6, and R_7 and R_8 are substituents on the phenyl rings and where T is selected from the group consisting of H, CH_3 and C_2H_5.

3,953,875

CAPACITOR STRUCTURE AND CIRCUIT FACILITATING INCREASED FREQUENCY STABILITY OF INTEGRATED CIRCUITS

David L. Cave, Mesa, and Walter R. Davis, Tempe, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

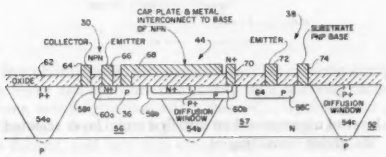
Filed Jan. 2, 1974, Ser. No. 430,267
Int. Cl.² H01L 27/02
U.S. Cl. 357—51 4 Claims

1. In a monolithic integrated circuit structure having a plurality of diffused heavily doped isolation regions of a first

conductivity type to isolate epitaxial islands of a second conductivity type, a monolithic capacitor structure, the improvement comprising:

a first region of a second conductivity type, said first region being diffused into at least one of the plurality of isolation regions and forming a PN junction therewith, the outwardly facing surface of said first region being substantially equal in surface area to the surface area of the other of the plurality of isolation regions and being a portion of the surface of the monolithic integrated circuit;

a layer of dielectric material, said dielectric material being grown over a main portion of said outwardly facing surface of said first region;



a first layer of metallization, said first layer of metallization being contiguous with the outwardly facing surface of said layer of dielectric material for forming a first plate of the capacitor; and

said first region being a second plate of the capacitor such that the monolithic capacitor structure thus formed in the isolation region of the monolithic circuit structure requires minimum useful area of the monolithic integrated circuit to be utilized in construction thereof, the plurality of isolation regions being otherwise required to provide isolation in the operation of the monolithic integrated circuit.

3,953,876

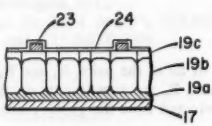
SILICON SOLAR CELL ARRAY

Erhard Sirtl, Munich, Germany, and Cedric G. Currin, Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Division of Ser. No. 367,913, June 7, 1973, Pat. No. 3,900,943. This application July 11, 1974, Ser. No. 487,698

Int. Cl.² H01L *29/04, 27/14, 31/00*

U.S. Cl. 357—60 **2 Claims**



1. A silicon solar cell array comprising

a sheet of silicon consisting of monocrystalline columnar grains having substantially vertical grain boundaries between said crystallites,

each of said crystallites having a p-type conductivity volume, an n-type conductivity volume and a p-n junction at the juncture of said p-type and n-type volumes,

said p-n junctions intersecting said vertical grain boundaries and crossing said crystallites in planes substantially parallel to the longitudinal axes of said sheet;

a p^+ conductivity type layer of silicon in ohmic contact with the p-type volumes of said crystallites,

an n^+ conductivity type layer of silicon in ohmic contact with the n-type volumes of said crystallites, and

electrical leads connected to said p^+ conductivity type layer and said n^+ conductivity type layer.

3,953,877

SEMICONDUCTORS COVERED BY A POLYMERIC HEAT RESISTANT RELIEF STRUCTURE

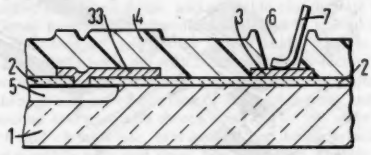
Reiner Sigusch, Munich, and Dietrich Widmann, Unterhaching, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed May 21, 1974, Ser. No. 471,952

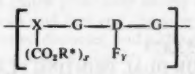
Claims priority, application Germany, May 23, 1973, 2326314

Int. Cl.² H01L *23/28*

U.S. Cl. 357—72 **7 Claims**



1. A semiconductor component having a polymeric heat-resistant relief structure thereon, comprising a semiconductor substrate, an insulating layer at least partially covering said substrate, a conductor component layer at least partially covering said insulating layer, a layer of a polymer covering said substrate and said conductor component, said polymer being derived from a soluble pre-polymer, said prepolymer having repeating units of the formula:



wherein, X and D each comprise a carbocyclic and/or heterocyclic nucleus;

G is selected from the group consisting of amide urea or urethane linkages;

R* is an organic radical containing a photo- or radiation induced di- or polymerizable olefinic double bond; and is a component of ester group CO_2R^*, said group bound to said nucleus in ortho or peri position to G;

F is a group capable of reacting with the carbonyl group of CO_2R^* to form a cyclic structure upon heating of the prepolymer to liberate R*OH; and wherein F is arranged in ortho- or peri- position to G;

x is **1** or **2**; and

y is **0** or **2**;

said pre-polymer having been cross-linked through exposure or irradiation of the photo- or radiation-reactive groups, said layer having at least one contact opening therein formed by dissolving the non-exposed or non-irradiated portions of said pre-polymer, with a solvent and a conductive element contacting said conductive layer in said opening.

3,953,878

CONSTANT TEMPERATURE CONTROL FOR TRANSFERRED ELECTRON DEVICES

Daniel David Mawhinney, Livingston, and Thomas Edward Walsh, Kearny, both of N.J., assignors to RCA Corporation, New York, N.Y.

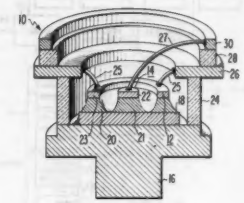
Continuation of Ser. No. 417,388, Nov. 19, 1973, abandoned. This application Mar. 12, 1975, Ser. No. 557,532

Int. Cl.² H01L *23/02*

U.S. Cl. 357—81 **7 Claims**

1. A constant temperature device comprising two transferred electron bulk semiconductor devices, said transferred electron devices each comprising a body of semiconductor material having a high mobility state which is low in energy and a low mobility state which is high in energy and which is capable of transferring electrons from said high mobility state to said low mobility state under the influence of an electric

field above a threshold voltage and contacts at the opposite ends of the body, said transferred electron devices having thermally connected semiconductor material, means biasing one of said two transferred electron devices above the threshold voltage of said one transferred electron device whereby



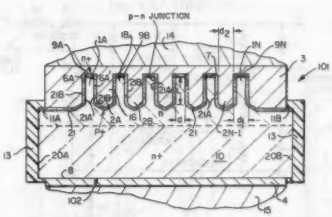
said one transferred electron device exhibits a negative resistance and means biasing the other transferred electron device of said two transferred electron devices below said threshold voltage of said other transferred electron device whereby said other transferred electron device exhibits a positive resistance.

3,953,879

CURRENT-LIMITING FIELD EFFECT DEVICE

Jorge O'Connor-d'Arlach, Cochabamba, Bolivia, and Clifton G. Fonstad, Jr., Cambridge, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 12, 1974, Ser. No. 488,610
Int. Cl.² H01L *29/80, 29/06, 29/04*
U.S. Cl. 357—22 **39 Claims**



1. A two-terminal, current-limiting device for use in an electric circuit, that comprises: a crystalline-material semiconductor wafer having at one major surface thereof a plurality of N channels of length L, width Z and thickness *d*, wherein the ratio NZ/L is at least one hundred and wherein $L/d \geq 3$, said device further comprising a gate region formed in the side walls of each channel and a source terminal and a drain terminal, the gate region of each channel being internally shorted to one of the terminals of the device.

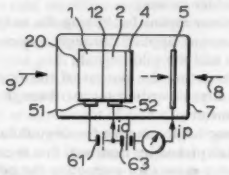
3,953,880

SEMICONDUCTOR PHOTOELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 27, 1974, Ser. No. 455,231
Claims priority, application Japan, June 28, 1973, 48-72294
Int. Cl.² H01L *27/14, 31/00, 29/161*
U.S. Cl. 357—30 **4 Claims**

1. A semiconductor photoelectron emission device, comprising a p-type semiconductor wherein electrons are excited by incident light from the valence zone to the conduction zone, and having a first region of an direct transition type semiconductor of GaSb and a second region of indirect type semiconductor of $Al(x)Ga(1-x)Sb$, wherein x is less than one and positive, with a heterojunction therebetween, said first and second regions having substantially the same crystal structures at said heterojunction and having small differences in lattice constants, said second region having a broader effec-



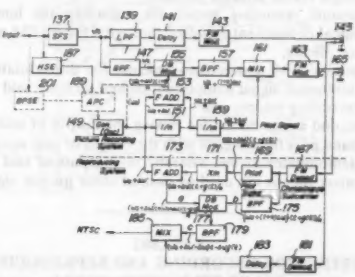
tive forbidden band than that of said first region, with the exposed surface of said second region having been activated by negative electron affinity and biasing means for impressing a biasing voltage between said first region and said surface to cause electrons to drift to said surface to be emitted from said surface to a vacuum.

3,953,881

COLOR PICTURE INFORMATION RECORDING AND REPRODUCING SYSTEM

Akio Yanagimachi, Kawasaki, and Osamu Yamada, Kodaira, both of Japan, assignors to Nippon Hose Kyokai and Hitachi, Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 419,254, Nov. 27, 1973, abandoned. This application Mar. 25, 1975, Ser. No. 561,708
Claims priority, application Japan, Dec. 1, 1972, 47-119830
Int. Cl.² H04N *5/76, 9/00*
U.S. Cl. 358—4 **8 Claims**



1. A color picture information recording and reproducing system for color picture signals including a chrominance subcarrier in any one frame or field transmitted together with a synchronizing signal having a frequency which is in a certain relation with that of said chrominance subcarrier, the system comprising:

a single frame selector means for selectively recording color picture signals in any one frame or field period,

a signal generator means for generating reference signals,

a control means for controlling said signal generator means to frequency-lock the output of said signal generator means with the synchronizing signal included in the color picture signals,

a first frequency divider means for dividing the frequency of the output of said signal generator means,

a second frequency divider means for dividing the frequency of the output of the first frequency divider means to form a pilot signal,

a first frequency adder means for combining the frequency of the output of said signal generator means with the frequency of the output of said first frequency divider means,

a first modulator means for modulating the chrominance subcarrier of the color picture signals selected by the single frame selector means and supplied through a first band pass filter means with the output signal of said first frequency adder means,

a first signal mixer means for mixing the output of the first modulator means applied through a second band pass filter means and the pilot signal,

means for connecting the output of the first signal mixer means to a first recording means through a second FM modulator means,

a first FM demodulator means for demodulating the color picture signals picked up from said first recording means,

a signal extractor means for extracting the pilot signal from the output of said first FM demodulator means,

a frequency multiplier means for multiplying the frequency of the output of said pilot signal extractor means,

a second frequency adder means for combining the frequency of the output of said frequency multiplier means with the frequency of the output of said signal generator means,

a third band pass filter means for extracting the chrominance subcarrier from the output of said first FM demodulator means,

a third modulator means for modulating the chrominance subcarrier of the output of the third band pass filter means with the output of said second frequency adder means,

a fourth band pass filter means coupled to the output of said third modulator means for extracting the chrominance subcarrier having the same frequency as an original chrominance subcarrier included in incoming color picture signals,

a lowpass filter means for extracting the luminance signal component of the color picture signals selected by the single frame selector means,

a second recording means for recording the luminance signal component supplied through a fourth FM modulator means,

a second FM demodulator means for demodulating the luminance signal component picked up from said second recording means, and

a second mixer means for mixing the output of said fourth band pass filter means with the output of said second FM demodulator means whereby the outputs of said second mixer means are used as desired color picture signals.

3,953,882

SYSTEM FOR RECORDING AND REPRODUCING A COLOR TELEVISION SIGNAL

Ichiro Arimura, Kyoto; Hiroshi Taniguchi, Hirakata, and Kunio Sekimoto, Daito, all of Japan, assignors to Matsushita Electric Industrial Company, Ltd., Osaka, Japan

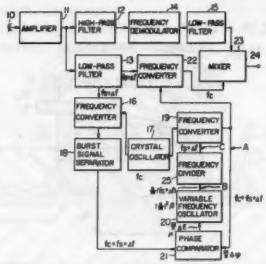
Filed Aug. 29, 1974, Ser. No. 501,431

Claims priority, application Japan, Sept. 7, 1973, 48-101337

Int. Cl.² H04N 9/02

U.S. Cl. 358—8 **11 Claims**

1. A system for recording and reproducing a color television signal comprising means for obtaining a burst signal from a reproduced frequency converted chrominance signal; a variable frequency oscillator to produce a first continuous signal, said burst signal controlling the frequency and phase of said first continuous signal; means for dividing the frequency of said first continuous signal by n/m where m and n are integers and $m<n$, to produce a second continuous signal; a stable fixed frequency oscillator for producing a third steady continuous signal; means for heterodyning said second continuous signal and said third steady continuous signal to produce a fourth continuous signal having a frequency equal to the sum of the frequencies of said second and third signals; and means for heterodyning said reproduced frequency converted chrominance signal with said fourth continuous signal to thereby recover the original chrominance signal free from a time axis variation component.



3,953,883

COMBINED BRIGHTNESS CONTRAST AND COLOR SATURATION CONTROL CIRCUIT

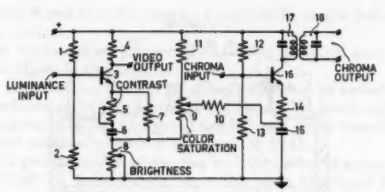
Gunter Paul Grewe, Don Mills, Canada, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1974, Ser. No. 531,331

Claims priority, application Canada, Feb. 11, 1974, 192182

Int. Cl.² H04N 9/537

U.S. Cl. 358—27 **4 Claims**



1. A circuit for controlling substantially independently the gain of luminance and chroma amplifiers and simultaneously the gain of the luminance and chroma amplifiers and the average brightness of a color television picture reproducing apparatus, said circuit comprising a luminance amplifier means for directly coupling to and supplying direct current for a color television picture reproduction tube, said luminance amplifier having a common AC and DC feedback path means to control the gain of the luminance amplifier, an average brightness luminance and chrominance control means coupled to said path for controlling the supply of direct current voltage to the luminance amplifier, a chroma amplifier, and means to select a portion of the voltage supplied to the luminance amplifier to determine the operational bias of the chroma amplifier.

3,953,884

VIDEO AMPLIFIER FOR DERIVING COLOR SIGNALS

Mitsuo Isobe, 5-103, Fujitacho, Moriguchi, Osaka, and Toshihiko Yoshino, 7-404, Miyokenzaka 5-chome, Katano, Osaka, both of Japan

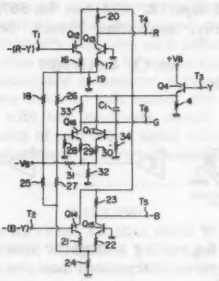
Filed Oct. 15, 1974, Ser. No. 514,371

Int. Cl.² H04N 9/52

U.S. Cl. 358—30 **7 Claims**

1. A video amplifier fo: deriving a primary color signal from a luminance signal and a color difference signal, comprising a

source of a DC voltage having said luminance signal impressed thereon, means providing a color difference signal, first and second transistors connected to form a differential amplifier, means continually connecting the collector of one of said transistors to said source, a resistor continually connecting the



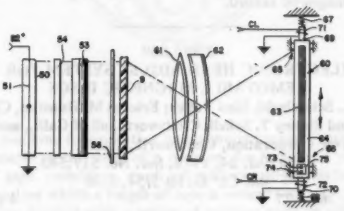
collector of the other of said transistors to said source, means applying said color difference signal to the base of said first transistor, and an output terminal connected to the collector of the other transistor, whereby said primary color signal is produced at said output terminal.

3,953,885

ELECTRONIC SOUND MOTION PICTURE PROJECTOR AND TELEVISION RECEIVER

Conrad H. Biber, Needham, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 3, 1974, Ser. No. 502,449
Int. Cl.² H04N 9/11
U.S. Cl. 358—54 **23 Claims**



1. Apparatus for producing a video signal from a strip of color transparency film of the type comprising a repetitive series of parallel filter stripes of different colors, said apparatus comprising, means for moving the strip along a predetermined path in a direction parallel to said stripes, a linear photoresponsive array of signal generating means, one signal generating means for each of a set of said stripes, means mounting said array adjacent said path and perpendicular to said stripes, means for illuminating said array through said strip, means for detecting the order of registration of light through said stripes of different colors falling on the particular signal generating means of said array, and means for adjusting the position of said array relative to the strip to align filter stripes of a predetermined color with predetermined elements of said array.

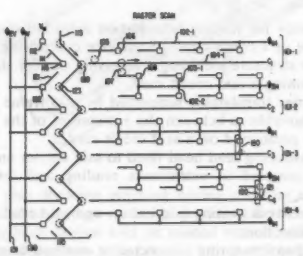
3. In combination with a color television receiver of the type employing a one-gun sequential phosphor stripe receiving tube, said television receiver having a beam deflection system for establishing the position of an electron beam on the face of the tube and a video output amplifier for controlling the intensity of an electron beam produced by said gun, and means for marking the position of a beam on the tube relative to phosphor stripes of different colors on the screen; switching means having first and second states, means controlled by said switching means in its first state and responsive to broadcast television signals for applying signals to said deflection system and to said output amplifier for producing a conventional television display, and projection signal generating means for applying signals from a strip of motion picture film of the type comprising a repetitive series of parallel filter stripes of different colors to said amplifier and said deflection system in said second position of said switch, said projection signal generating means comprising means for moving a strip of film along a predetermined path in a direction parallel to the filter stripes on the film, a linear photoresponsive array of signal generating means, means mounting said array along said path normal to the direction of movement of said stripes, means responsive to the position of the photoresponsive signal generating means of said array relative to the filter stripes of the film for maintaining the photoresponsive signal generating means of the array and the filter stripes in registration, and means synchronized with said deflection system for strobing said video signals to said amplifier in correspondence with the position of said beam relative to corresponding filter stripes on said screen.

3,953,886

PLANAR RASTER SCAN DISPLAY WITH GAS DISCHARGE SHIFT REGISTERS

Peter Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 4, 1974, Ser. No. 520,614
Int. Cl.² H04N 5/44
U.S. Cl. 358—56 **21 Claims**



1. A two-dimensional graphical display system comprising

a first set of S plasma discharge shift registers where S ≥ 1, each of said shift registers in said first set including a plurality of ordered stable discharge locations,

a second set of LS ordered plasma discharge shift registers, L ≥ 2, each of said shift registers in said second set including N ordered stable discharge locations, and each being coupled to a given one of said stable discharge locations in one of said shift registers in said first set in such manner that a glow discharge occurring at said given stable discharge locations in said first set may be non-destructively transferred to the first of said N stable discharge locations,

means for sequentially propagating a glow discharge along each of said first set of plasma discharge shift registers, and

means for propagating a transferred glow discharge along each of said second set of shift registers,

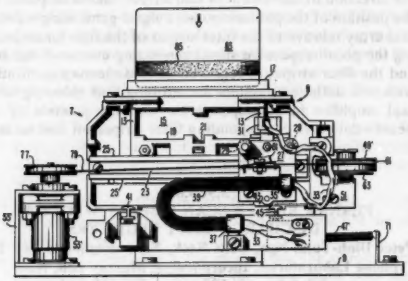
whereby S scanning glow discharges are propagated over said second set of shift registers.

3,953,887

SPRING DRIVEN VELOCITY CONTROLLED MAGNETIC STRIPE READER

Lawrence P. Kobylarz, Howell, and Ronald H. Mack, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 15, 1974, Ser. No. 524,082
Int. Cl.² G11B 25/04; G06K 7/08
U.S. Cl. 360—2 12 Claims



1. A device for reading information recorded on the magnetic stripe of a credit card, said device comprising:

a. frame structure including a receiving slot for stationarily positioning a said credit card,

b. a carrier translatably supported by said frame structure and movable as between the extremities of the magnetic stripe positioned on a said credit card,

c. a transducing read head fixed to said carrier and electrically coupled to extraneous reading and interpreting means,

d. means for activating said carrier and said read head in a first direction,

e. an expansion spring connected at one end to said frame structure,

f. a first flexible cable coupled at at least one end to said carrier,

g. a second flexible cable coupled at one end to the other end of said expansion spring, and

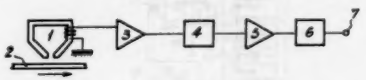
h. rotatable means supportably and angularly interposed between said expansion spring and said carrier and having a concentric circumference and an adjacent spiraling circumference of varying radii ranging from a maximum radius substantially equal to the radius defining said concentric circumference to a minimum radius of predetermined lesser dimension, the other end of said second flexible cable being connected to said maximum radius of said spiraling circumference and said first flexible cable being coupled to said concentric circumference, whereby said rotatable means is rendered effective to counteract the normal variations in the pulling force applied by said expansion spring in the translation of said carrier and said read head in a second direction from a first position representing a read-start extremity of said magnetic stripe to a second position representing a read completed extremity of said stripe to thereby provide a uniform and constant velocity of travel of said read head between said first and said second positions.

3,953,888

DEVICE FOR READING A BINARY-CODED MAGNETIC RECORDING

Jacques Droux, Paris; Michel Audebert, Bourg-la-Reine, and Gérard Millair, Noisy-le-Sec, all of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Sept. 18, 1974, Ser. No. 507,136
Claims priority, application France, Sept. 19, 1973, 73.33582
Int. Cl.² G11B 5/09
U.S. Cl. 360—46 16 Claims



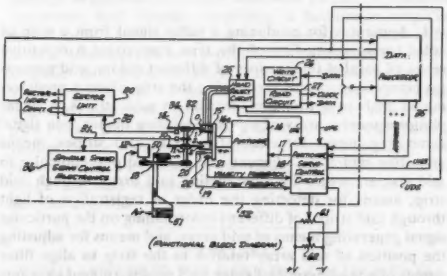
1. A device for reading a magnetic record consisting of successive flux reversals separated from one another by first and second differing time intervals representative of respective states of a binary code, comprising reading head means for generating an analog voltage signal in response to said magnetic record, said analog voltage signal including a fundamental component corresponding with the time intervals and harmonics resulting from frequency-dependent distortions caused by the reading head means transducing the flux reversals into the analog voltage signal, and circuit means for amplifying, processing and digitizing said voltage signal to reproduce said binary code, wherein said circuit means includes a frequency-selective correction means to substantially compensate for the frequency-dependent distortions caused by said reading head means, said correction means including combined amplifier and filter means operative for restoring the proper relationship between the fundamental and at least the lower-order harmonic frequencies in said analog voltage signal which correspond to said first and second time-intervals in said magnetic record.

3,953,889

ELECTRONIC HEAD ADJUST SYSTEM FOR REMOVABLE MAGNETIC DISCS

James L. Scieszinski, Simi Valley; Ericsen M. Dunstan, Calabasas, and Sidney T. Schell, Chatsworth, all of Calif., assignors to Pertec Corporation, Chatsworth, Calif.

Filed Oct. 24, 1974, Ser. No. 517,543
Int. Cl.² G11B 5/54, 5/58
U.S. Cl. 360—77 4 Claims



1. In an enclosed disc file having a drive unit for discs with concentric addressable data tracks, at least one of said discs being removable, a servomechanism for positioning said transducers to a preselected track in response to address signals and a corrective position error signal, and mechanical means for adjusting the position of each transducer associated with said removable disc over a reference track on a master disc at a preselected track address said enclosed disc file having an

enclosure which may be opened for mechanically adjusting the position of each transducer, the improvement comprising:

a separate offset signal source for each of said transducers associated with said removable disc,

summing means for adding a signal to said corrective position error signal,

means for selectively coupling a signal from one of said offset signal sources to said summing means for addition to said corrective position error signal, and

means for individually adjusting each offset signal source for fine position adjustment of an associated transducer while said associated transducer is being positioned to said reference track on said master disc by said servomechanism with said enclosure closed, said adjusting means for each of said offset signal sources being positioned for adjustment from outside said enclosure.

3,953,890

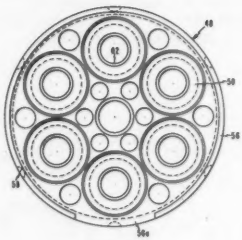
INFORMATION RETRIEVAL MACHINE WHICH USES A CASSETTE FOR HOLDING TAPE CARTRIDGES

Donald John Wanek, and Gordon Wilbur Westphal, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,453

Int. Cl.² G11B *5/52, 15/66, 23/04*

U.S. Cl. 360—85 **10 Claims**



1. A machine for operating on magnetic tape and including

a cassette in the form of a carousel for holding a plurality of tape cartridges, each of said cartridges including a spool on which a length of tape is wound and said cassette being formed with a series of cavities each of which receives one of said cartridges to hole its spool with its axis substantially parallel with the major axis of said cassette,

means for rotatively mounting said cassette so that it may rotate about its major axis,

a plunger and a cartridge spool receiving shaft coaxially mounted with respect to each other and with respect to the spool of a cartridge in one of said cavities depending upon the rotative position of said cassette,

means on the end of said plunger for moving into said last named cavity and for mechanically engaging with the spool of the cartridge in this cavity,

means for reciprocably driving said plunger so that said plunger moves said cartridge onto said shaft and subsequently moves said cartridge back off of said shaft into the cavity for the cartridge after processing of the tape of the cartridge,

means defining a path for said tape when it leaves a cartridge on said shaft,

a takeup spool at the end of said path for winding up the tape as it moves along said path from its cartridge on said shaft,

a magnetic head in said path for transferring information with respect to said tape as it moves along said path,

means for driving said cartridge spool receiving shaft first in a reverse direction tending to wind up the tape onto the spool of the cartridge on said shaft, and

means for subsequently driving the tape of the cartridge on said shaft in the opposite or forward direction to unwind the tape and move it along said path, said last named driving means including a tape contacting roller carried by a swing lever and means for driving said roller and means for moving said lever toward the tape of the cartridge on said shaft, said lever being provided with a relatively sharp tape peeling end for peeling the end of the tape of the cartridge on said shaft off of the remainder of the tape as wound on the spool of this cartridge.

3,953,891

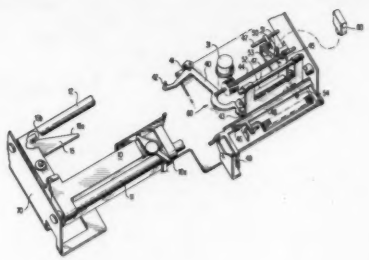
SOUNDHEAD RESTORE MECHANISM FOR USE IN A DISC MACHINE

Terry Lee Wilmoth, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 17, 1975, Ser. No. 559,343

Int. Cl.² G11B *17/04, 25/04, 5/012*

U.S. Cl. 360—105 **2 Claims**



1. In a disc dictation machine having a loader carrier for effecting a disc change cycle by ejecting a first disc from a record/playback station into an unload station and transferring a second disc from a load station into the record/playback station, apparatus for positioning a magnetic soundhead at a predetermined start phasing position comprising:

a soundhead;

a soundhead transport slidably mounted for translation in a plane parallel to the surface of a disc in the record/playback station;

means resiliently attaching said soundhead to said soundhead transport;

a lead screw;

pawl means attached to said soundhead transport and resiliently engaging said lead screw for imparting translatory motion to said soundhead transport;

spring biased bail means contacting said pawl means;

a cam surface integral with said bail means for receiving force from said loader carrier to rotate said bail means into contact with said pawl means thereby disengaging said pawl means from said lead screw;

a bellcrank pivotally mounted and having a first end attached to said soundhead transport;

a pin attached to the second end of said bellcrank; and

cam means attached to said loader carrier for engaging said pin during a disc change cycle and rotating said bellcrank to translate said soundhead transport and restore said soundhead to a predetermined position.

DESIGN PATENTS

GRANTED APRIL 27, 1976

ERRATA

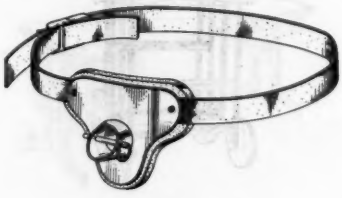
For CLASS	See PATENT NO.
019–076	239,700
025–025	239,701
025–002	239,702
016–078	239,735
026–001 R	239,736

DESIGNS

APRIL 27, 1976

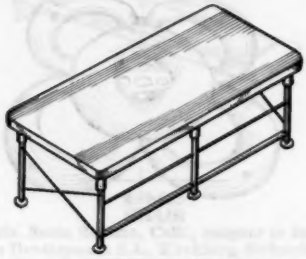
239,667
SWIM SUIT
Eleanor Bouchard, Miller Hill Road, Dover, Mass. 02030
Filed Apr. 24, 1974, Ser. No. 463,466
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—25

239,668
SPORTS FISHING BELT
Anthony M. Vanus, 105 Brown Drive, Claremont, Calif. 91711
Filed Nov. 4, 1974, Ser. No. 520,367
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381



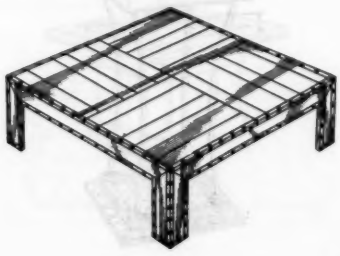
239,669
FOOT SOCK
Raymond Jacobs, New York, N.Y., assignor to Kalso Systemet, Inc., New York, N.Y.
Filed Aug. 16, 1974, Ser. No. 498,087
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—330

239,670
PORTABLE MASSAGE TABLE
Pedro A. Varea, 116 38th St., Union City, N.J. 07087
Filed Nov. 12, 1973, Ser. No. 414,861
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

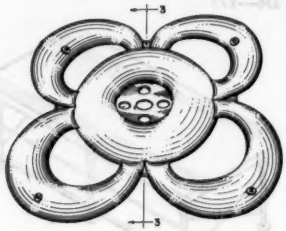


239,671
UPHOLSTERED SEAT
Giovanni Offredi, Milan, Italy, assignor to Fratelli Saporiti, Besnate, Varese, Italy
Filed Mar. 18, 1974, Ser. No. 452,416
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47

239,672
COCKTAIL TABLE OR THE LIKE
Joseph E. Adkinson, 3807 Leland St., Chevy Chase, Md. 20015
Filed Apr. 23, 1974, Ser. No. 463,291
Term of patent 7 years
Int. Cl. D6—*03*
U.S. Cl. D6—177

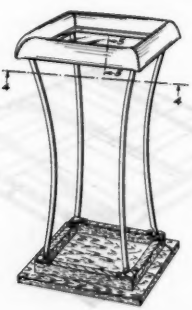


239,673
FLOATABLE TRAY FOR BEVERAGE GLASSES
Wilhelmine Ziegler, 8 Sprottauer-Strasse, 85 Nuremberg, Germany
Filed Aug. 5, 1974, Ser. No. 495,689
Claims priority, application Germany Feb. 4, 1974
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—146

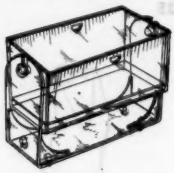


239,674
MODULAR PEDESTAL UNIT
John S. Carter, The Forge, N. Lane, Foxton, Market Harborough, Leicestershire, England
Filed Aug. 27, 1974, Ser. No. 500,848
Claims priority, application Great Britain Feb. 27, 1974
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

239,675
COUNTER HEIGHT BAR TABLE OR THE LIKE
Gaye P. Noe, P.O. Box 2062, Jacksonville, Fla. 32203
Filed Sept. 30, 1974, Ser. No. 510,424
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—27



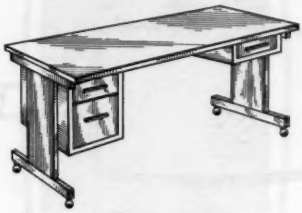
239,676
BASSINET
Julianne L. McGinley, 430 E. 63rd St., New York, N.Y. 10021
Filed Oct. 2, 1974, Ser. No. 511,316
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—15



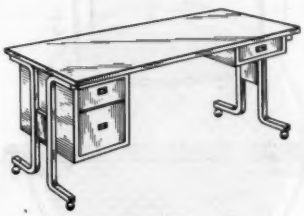
239,677
FLORAL DISPLAY CART
Jack L. Shaw, 4365 Greenberry Lane, Annandale, Va. 22003
Filed Oct. 11, 1974, Ser. No. 514,187
Term of patent 14 years
Int. Cl. D6—*04;* D12—*02*
U.S. Cl. D6—182

239,678
STAND FOR SUPPORTING A ROCK SPECIMEN
Jack E. Blake, 514 Gulf Bldg., Midland, Tex. 79701
Filed Oct. 11, 1974, Ser. No. 514,188
Term of patent 7 years
Int. Cl. D6—*99*
U.S. Cl. D6—85

239,679
DESK
Robert J. Szucs, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 31, 1974, Ser. No. 519,476
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



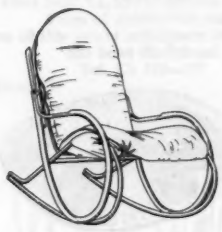
239,680
DESK
Robert J. Szucs, Midlothian, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Oct. 31, 1974, Ser. No. 519,479
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



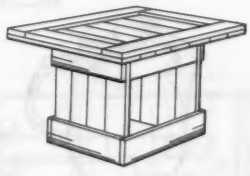
239,681
COLLAPSIBLE MUSIC STAND
Donald R. Smith, Brookville, Ind., assignor to Manual Arts Furniture Company, Cincinnati, Ohio
Filed Nov. 15, 1974, Ser. No. 524,152
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—18

239,682
TISSUE BOX HOLDER
William H. Farmer, Box 248, Kingston, Okla. 73439
Filed Dec. 2, 1974, Ser. No. 528,912
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—85

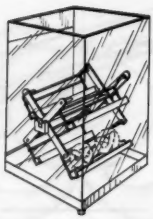
239,683
CHAIR
Paul Tuttle, Santa Barbara, Calif., assignor to Intercollection Development S.A., Kirchberg, Switzerland
Filed Jan. 2, 1975, Ser. No. 538,166
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



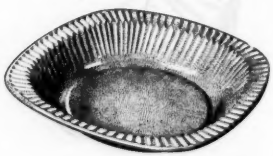
239,684
TABLE OR THE LIKE
Stephen H. Robertson, 4108 Deep Hollow Drive, Apt. 277, and Randall L. Ward, 4102 Deep Hollow Drive, Apt. 284, both of Raleigh, N.C. 27612
Filed Feb. 18, 1975, Ser. No. 550,779
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



239,685
DISPLAY UNIT
Jeffrey E. Peterson, Hinsdale, Ill., assignor to International Pretzel Corporation, Oakbrook, Ill.
Filed June 12, 1975, Ser. No. 586,285
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—175

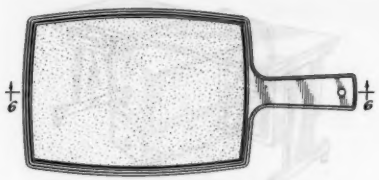


239,686
BOWL
Karl Gösta Bertil Andersson, Halmstad, Sweden, assignor to Duni Bila AB, Halmstad, Sweden
Filed Feb. 4, 1974, Ser. No. 439,121
Claims priority, application Sweden Aug. 6, 1973
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—1

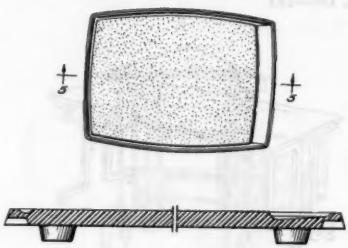


239,687
COFFEE POT
Carl-Arne Breger, Lilla Molleberga, 21290 Malmo, Sweden
Filed Mar. 20, 1974, Ser. No. 453,153
Claims priority, application Sweden Sept. 21, 1973
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—65

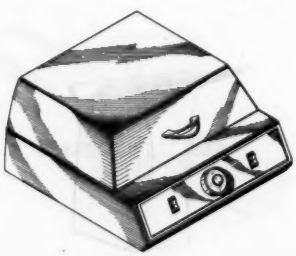
239,688
CUTTING BOARD
Donald W. Doman, Janesville, and Gerald A. Rau, Baraboo, Wis., assignors to Flambeau Products Corporation
Filed Apr. 1, 1974, Ser. No. 456,951
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—46



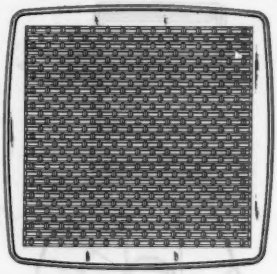
239,689
CUTTING BOARD
Donald W. Doman, Janesville, and Gerald A. Rau, Baraboo, Wis., assignors to Flambeau Products Corporation
Filed Apr. 1, 1974, Ser. No. 456,953
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—46



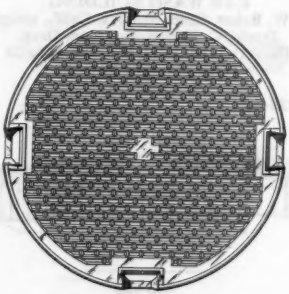
239,690
MICROWAVE OVEN
Beverly D. Kumpfer, Salt Lake City, Utah, assignor to Utah State University Foundation, Logan, Utah
Filed Dec. 13, 1974, Ser. No. 532,561
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128



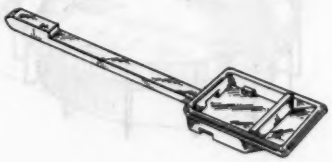
239,691
CONTAINER GRID OR THE LIKE
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 8, 1975, Ser. No. 539,362
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—130



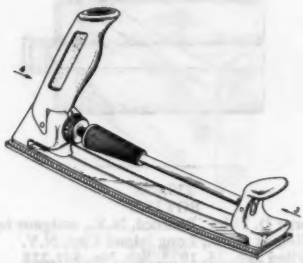
239,692
CONTAINER GRID OR THE LIKE
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 8, 1975, Ser. No. 539,363
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—130



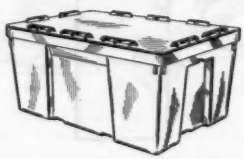
239,693
LATCHING ASSEMBLY FOR VEHICLE SEAT FOOD TRAY
Harry Mendell Smith, Colorado Springs, Colo., assignor to AMI Industries, Inc., Colorado Springs, Colo.
Filed Aug. 14, 1973, Ser. No. 388,221
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—109



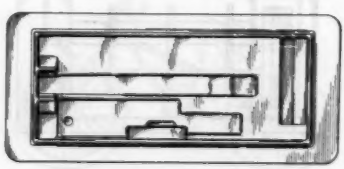
239,694
FILE OR RASP ALSO CAPABLE FOR USE AS A PLANE
Brian Ward, Retford, and David Scarrow, Dinnington, near Sheffield, England, assignors to Aven Tools Limited, Maltby, Rotherham, England
Filed Mar. 14, 1974, Ser. No. 451,267
Claims priority, application Great Britain Sept. 17, 1973
Term of patent 14 years
Int. Cl. D8—*03, 05*
U.S. Cl. D8—90



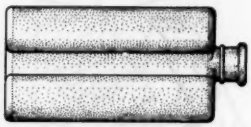
239,695
CONTAINER
Edward J. Fier, Jr., Mundelein, Ill., assignor to Norwesco, Inc., St. Paul, Minn.
Filed Nov. 12, 1973, Ser. No. 415,239
Term of patent 3½ years
The term of this patent subsequent to Dec. 16, 1989, has been disclaimed
Int. Cl. D9—*07*
U.S. Cl. D9—237



239,696
TRAY FOR RELEASABLY ENGAGING A RAZOR AND A BLADE DISPENSER
Martin Glaberson, Stratford, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Mar. 29, 1974, Ser. No. 456,086
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—186

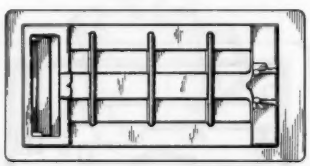


239,697
BOTTLE
Kenneth W. Hunt, Hialeah, Fla., assignor to Hunt-Wilde Corporation
Filed Nov. 27, 1974, Ser. No. 527,622
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—37

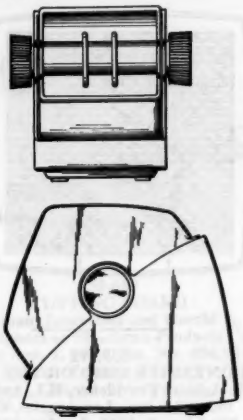


239,698
BOTTLE
George D. Utley, Bedford, N.Y., assignor to Relpak Corp., Long Island City, N.Y.
Filed Jan. 15, 1975, Ser. No. 541,325
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167

239,699
TRAY FOR RELEASABLY ENGAGING A RAZOR AND A BLADE CARTRIDGE DISPENSER
Martin Glaberson, Stratford, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Mar. 18, 1974, Ser. No. 452,173
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—186

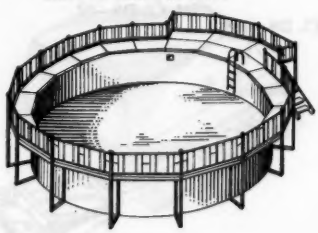


239,700
ROTARY CARD FILE
Joseph P. Maruca, Coventry, R.I., and Robert A. Chieda, Westport, Conn., assignors to Textron Inc., Providence, R.I.
Filed Aug. 28, 1973, Ser. No. 392,357
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—76

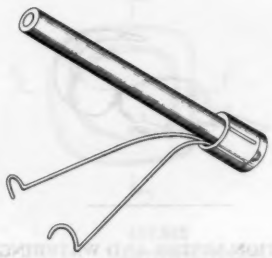


239,701
CAR WASH BUILDING
James W. Baker, Santa Monica, Calif., assignor to Daniel C. Hanna, Portland, Oreg.
Filed Oct. 15, 1973, Ser. No. 406,628
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25

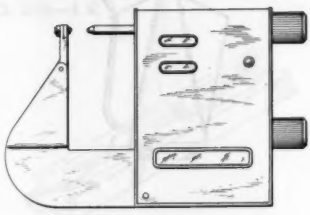
239,702
ABOVE GROUND SWIMMING POOL OR SIMILAR ARTICLE
Finley M. Bukaitz, Clifton, N.J., and George Neuser, Spring Valley, N.Y., assignors to Delta Industries, Inc., Carlstadt, N.J.
Filed Mar. 4, 1974, Ser. No. 447,549
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—2



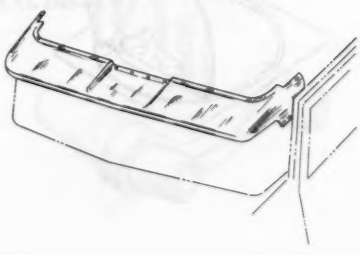
239,703
COMBINED HIGHWAY FLARE AND STAND THEREFOR
J. D. Moncrief, 3139 Woodmark Court, Sacramento, Calif. 95821
Filed June 17, 1974, Ser. No. 479,989
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—114



239,704
MICROMETER
Paul A. Morgan, Chicago, Ill., assignor to Century Wheels Research Corp., Lake Bluff, Ill.
Filed Sept. 27, 1974, Ser. No. 509,815
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

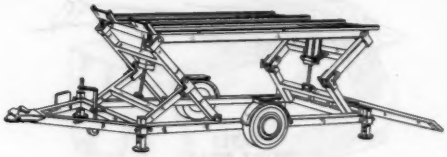


239,705
WINDSHIELD VISOR FOR TRUCKS
Allan W. Lund, 2641 118th Ave. NW., Minneapolis, Minn. 55433
Filed Dec. 5, 1974, Ser. No. 529,916
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—191

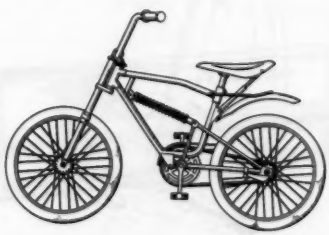


239,706
ALARM SYSTEM CABINET
David G. Barleen, Lafayette, Roger L. Ridings, Walnut Creek, and Theodore O. Pollard, Mountain View, Calif., assignors to Emergency Products Corporation, Parsippany, N.J.
Filed Dec. 23, 1974, Ser. No. 535,512
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

239,707
VEHICLE HOISTING TRAILER
Samuel Grimaldo, 776 W. Sandoval, Thousand Oaks, Calif. 91360
Filed Jan. 6, 1975, Ser. No. 538,552
Term of patent 14 years
Int. Cl. D12—*05, 10*
U.S. Cl. D12—56



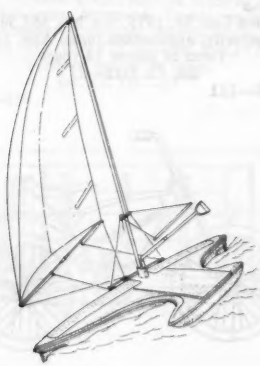
239,708
BICYCLE
Kazutaka Horino, Hamamatsu, and Takao Sato, Morimachi, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha
Filed Feb. 20, 1975, Ser. No. 551,303
Claims priority, application Japan Aug. 24, 1974
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—111



239,709
PEDAL CAR
Richard J. Scalone, 515 Cleveland Ave., Largo, Fla. 33540
Filed Feb. 27, 1975, Ser. No. 553,739
Term of patent 7 years
Int. Cl. D12—*11*
U.S. Cl. D12—107

239,710
LIGHT TWIN HELICOPTER
James R. Garrison, Arlington, Tex., assignor to Textron, Inc., Providence, R.I.
Filed Mar. 31, 1975, Ser. No. 563,506
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—73

239,711
SPORT BOAT
Richard Lynn Rineman, Brighton, Mich., assignor to Harold J. Rineman and S. Albert Young
Filed June 5, 1975, Ser. No. 584,123
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—64

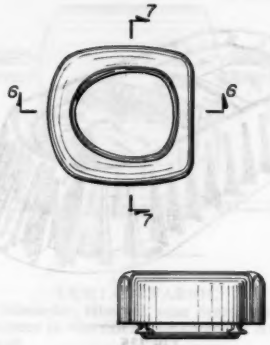


239,712
FISHING LURE
William D. Storm, Norman, Okla., assignor to Storm Plastics, Inc., Norman, Okla.
Filed July 16, 1975, Ser. No. 596,107
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

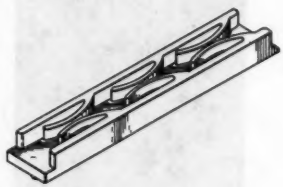
239,713
COMBINATION MISTER AND WATERING CAN
Jack Solomon, Island Park, N.Y., assignor to Pearl-Wick Corporation, Long Island City, N.Y.
Filed July 25, 1974, Ser. No. 491,936
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—11

239,714
COVER SPLASH GUARD FOR SINKS
David A. Pommiss, 7991 Sunrise Lakes Drive N., Fort Lauderdale, Fla. 33313
Filed Nov. 7, 1974, Ser. No. 521,588
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69

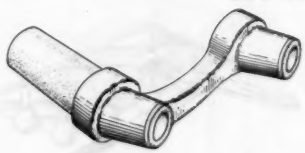
239,715
TOILET SEAT FOR INVALIDS
Milton Finlof, 3722 Martin Drive, San Mateo, Calif. 94403
Filed May 19, 1975, Ser. No. 578,540
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



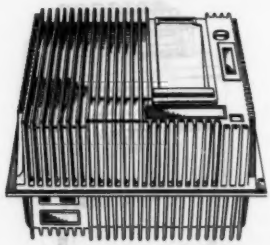
239,716
PRINTED CIRCUIT CARD GUIDE
Adam Tems, Philadelphia, Pa., assignor to Milross Controls, Inc., Southampton, Pa.
Filed Sept. 5, 1974, Ser. No. 503,247
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R



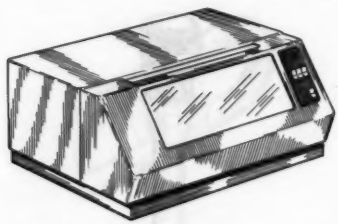
239,717
COMBINED BUS AND CURRENT LIMITING FUSE FOR TRANSFORMERS
George D. Allen, Harold D. Haubein, and Melvin B. Goe, Jr., Centralia, and Kenneth A. Toeniskoetter, Washington, Mo., assignors to A. B. Chance Company, Centralia, Mo.
Filed Mar. 26, 1975, Ser. No. 562,140
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 D



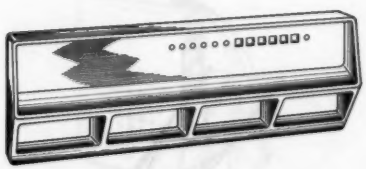
239,718
PROGRAMMABLE PRINTER
Howard A. Powers, Medfield, Mass., assignor to Modicon Corporation, Andover, Mass.
Filed Feb. 19, 1974, Ser. No. 443,200
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



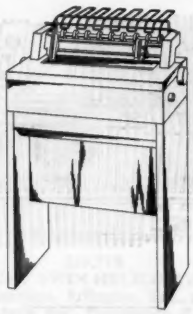
239,719
DATA PRINTER
Michael H. Tooke, Calabasas, Calif., assignor to Printronix
Filed Aug. 19, 1974, Ser. No. 498,434
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



239,720
FACEPLATE FOR A DATA SET HOUSING OR SIMILAR ARTICLE
James R. Stewart, San Jose, Calif., assignor to GTE Lenkurt Incorporated, San Carlos, Calif.
Filed Oct. 7, 1974, Ser. No. 512,568
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 R



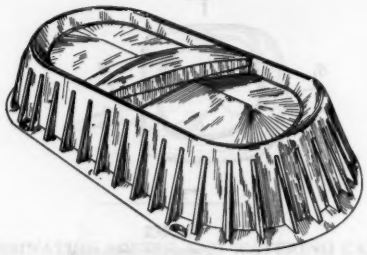
239,721
PRINTER STATION
Myron F. Davis, Jr., Boca Raton, Fla., and Charles A. Pycha, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 10, 1975, Ser. No. 540,308
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



239,722
MICROPHONE
Arthur W. Schmidt, Chicago, Ill., assignor to Shure Brothers Incorporated
Filed May 23, 1974, Ser. No. 472,628
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14 J

239,723
ASH COLLECTOR
William F. Martin, 350 Stonycroft Road, Ridgewood, N.J. 07450
Filed Jan. 16, 1974, Ser. No. 433,721
Term of patent 14 years
Int. Cl. D27—*03*
U.S. Cl. D27—8

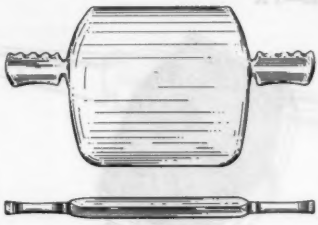
239,724
STOCK-WATERING TROUGH
James H. Kuzara, 307 W. Works; Norman L. Feck, 555 Wyoming Ave.; and Vincent P. Johnston, 1216 Leopard St., all of Sheridan, Wyo. 82801
Filed Apr. 4, 1974, Ser. No. 457,762
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



239,725
COMBINED GOLF CLUB HANDLE AND SHAFT
Lawrence E. Kindred, 1749 Crofton Parkway, Crofton, Md. 21113
Filed Nov. 5, 1974, Ser. No. 521,071
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GS

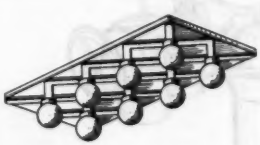
239,726
GOLF AID DEVICE
Victoria Wintering, 445 Bridge Road, Yacht and Country Club, Stuart, Fla. 33494
Filed Feb. 21, 1974, Ser. No. 444,517
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

239,727
SURF DIVER FOIL
Allen H. Sturmer, 3730 Inverrary Road, Apt. 2R, Lauderhill, Fla. 33313
Filed Apr. 30, 1975, Ser. No. 573,063
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—41

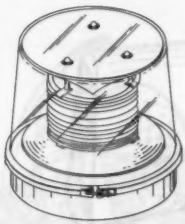


239,728
CURTAIN FABRIC
Peter Eric Schroeder, Oberwil, near Brenngarten, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed Sept. 11, 1974, Ser. No. 504,995
Claims priority, application Germany Mar. 13, 1974
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 E

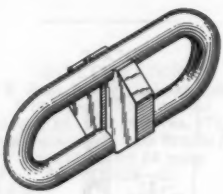
239,729
LIGHTING FIXTURE
Martin Alabardo, 5 Isolde Court, Pine Brook, N.J. 07058
Filed Nov. 14, 1974, Ser. No. 523,812
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—23 R



239,730
OMNIDIRECTIONAL LAMP
Edward Wilfrid Thomas, Chamblee, Ga., assignor to Unitron International Systems, Inc., Atlanta, Ga.
Filed July 29, 1974, Ser. No. 492,437
Term of patent 14 years
Int. Cl. D10—*06;* D26—*02*
U.S. Cl. D48—24 R



239,731
CHAIN LINK FOR POULTRY FEED CONVEYOR
Gerald L. Kitson, 9709 Belding Road, Rockford, Mich. 49341
Continuation-in-part of design application Ser. No. 314,856, Dec. 13, 1972. This application Jan. 15, 1975, Ser. No. 541,203
Term of patent 14 years
Int. Cl. D8—*99;* D12—*05*
U.S. Cl. D55—1 C



239,732
RADIO
Hoi Tong Vong, 179–180 Connaught Road W., Cheung Ka Industrial Bldg., Block A, Hong Kong
Filed June 14, 1974, Ser. No. 479,300
Claims priority, application Great Britain Feb. 19, 1974
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

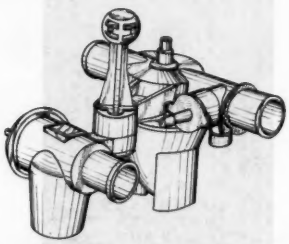
239,733
RADIO
Hoi Tong Vong, 179–180 Connaught Road W., Cheung Ka Industrial Bldg., Block A, Hong Kong
Filed June 19, 1974, Ser. No. 480,697
Claims priority, application Great Britain Dec. 21, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

239,734
RADIO
Hoi Tong Vong, 179–180 Connaught Road W., Cheung Ka Industrial Bldg., Block A, Hong Kong
Filed June 19, 1974, Ser. No. 480,699
Claims priority, application Great Britain Dec. 21, 1973
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4 B

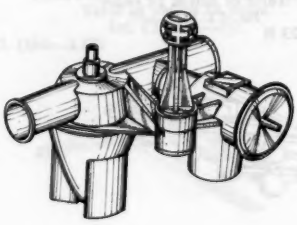
239,735
SPECTACLE FRONT
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed Dec. 13, 1974, Ser. No. 532,347
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—78

239,736
LOADED FILM CARTRIDGE
Harvey H. Dudley, Penfield, Robert I. Gresens, Rochester, David E. Hansen, Fairport, Stephen H. Miller, Irondequoit, and Robert C. Sutliff, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 30, 1973, Ser. No. 411,125
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D26—1 R

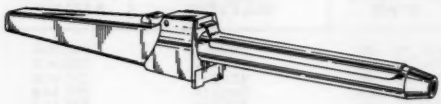
239,737
MANIFOLD NEBULIZER UNIT
Joel F. Giurtino, Arvada, Colo., assignor to Sandoz, Inc., East Hanover, N.J.
Filed Jan. 18, 1974, Ser. No. 437,321
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 N



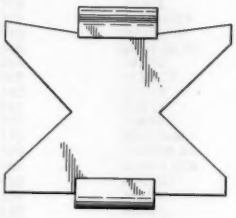
239,738
MANIFOLD NEBULIZER UNIT
Joel F. Giurtino, Arvada, Colo., assignor to Sandoz, Inc., East Hanover, N.J.
Filed Jan. 28, 1974, Ser. No. 437,322
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1 N



239,739
ELECTRIC HAIR CURLING IRON
Samuel L. McNair, Overland Park, Kans., assignor to Dazey Products Co.
Filed Nov. 8, 1974, Ser. No. 521,947
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10 E

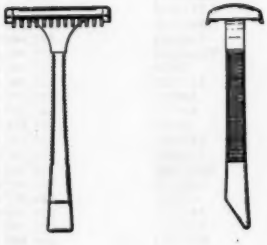


239,740
POCKET LOCK FOR A BILLFOLD
Woodrow Winston, 515 Walden Ave., Buffalo, N.Y. 14211
Filed Aug. 19, 1974, Ser. No. 498,544
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—2 R



239,741
HANDBAG FOR CARRYING BINGO ACCESSORIES
Maxine T. Mommsen, Chicago, Ill. (9020 Capitol Drive, Des Plaines, Ill. 60016)
Filed May 1, 1974, Ser. No. 465,857
Term of patent 7 years
Int. Cl. D3—*02*
U.S. Cl. D87—3 F

239,742
SAFETY RAZOR
Arnold E. Rees, Blyth, England, assignor to Wilkinson Sword Limited
Filed May 20, 1974, Ser. No. 471,206
Claims priority, application Great Britain Nov. 23, 1973
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A



CONSECUTIVE ORDER LISTING OF APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM

DOCUMENT NUMBER	CLASS/ SUBCLASS	PUBLISHED DATE	DOCUMENT NUMBER	CLASS/ SUBCLASS	PUBLISHED DATE
B 48,560	426/281	Mar. 30, 1976	B 364,797	210/23H	Feb. 17, 1976
B 54,859	260/23H	Feb. 17, 1976	B 367,092	260/471C	Apr. 13, 1976
B 59,512	360/125	Mar. 16, 1976	B 367,305	96/54	Mar. 2, 1976
B 66,272	423/242	Feb. 24, 1976	B 367,621	176/36R	Feb. 3, 1976
B 71,613	250/328	Mar. 16, 1976	B 369,221	260/927N	Feb. 24, 1976
B 73,017	358/28	Mar. 9, 1976	B 369,373	260/346.8R	Mar. 23, 1976
B 78,315	328/129	Feb. 10, 1976	B 369,379	423/27	Mar. 30, 1976
B 79,099	324/13	Jan. 13, 1976	B 370,309	252/364	Jan. 20, 1976
B 97,259	172/719	Mar. 9, 1976	B 371,095	260/239.1	Mar. 23, 1976
B 105,006	148/175	Mar. 23, 1976	B 371,635	427/93	Mar. 23, 1976
B 111,130	423/406	Mar. 16, 1976	B 371,912	206/451	Mar. 2, 1976
B 141,968	71/28	Mar. 30, 1976	B 372,016	260/239.1	Mar. 9, 1976
B 150,142	162/198	Jan. 27, 1976	B 372,232	8/115.5	Mar. 16, 1976
B 159,570	260/465.3	Mar. 23, 1976	B 372,722	423/15	Mar. 9, 1976
B 160,045	313/452	Jan. 13, 1976	B 373,344	214/18N	Feb. 3, 1976
B 160,099	427/343	Jan. 13, 1976	B 373,354	429/315	Jan. 27, 1976
B 163,463	425/222	Jan. 27, 1976	B 374,553	250/345	Mar. 30, 1976
B 167,470	204/181	Mar. 2, 1976	B 374,588	424/257	Jan. 27, 1976
B 181,208	424/45	Mar. 9, 1976	B 376,749	252/62.1L	Mar. 30, 1976
B 200,759	96/1.4	Feb. 3, 1976	B 378,513	136/202	Jan. 27, 1976
B 208,916	260/601R	Jan. 13, 1976	B 378,760	428/224	Mar. 9, 1976
B 214,925	264/140	Mar. 9, 1976	B 379,177	423/58	Jan. 27, 1976
B 223,678	220/66	Mar. 9, 1976	B 380,137	252/12.2	Mar. 23, 1976
B 231,416	204/192	Mar. 30, 1976	B 381,006	330/110	Apr. 6, 1976
B 236,266	260/75R	Mar. 23, 1976	B 381,709	427/70	Jan. 13, 1976
B 236,342	260/45.85R	Feb. 10, 1976	B 381,985	350/96WG	Feb. 3, 1976
B 248,240	343/7A	Jan. 13, 1976	B 382,120	260/239D	Mar. 23, 1976
B 257,143	260/42.15	Mar. 16, 1976	B 383,697	260/147	Feb. 17, 1976
B 270,274	340/8L	Feb. 17, 1976	B 384,225	350/150	Mar. 16, 1976
B 270,351	340/347SY	Mar. 30, 1976	B 384,330	176/20R	Jan. 27, 1976
B 271,743	260/80.78	Mar. 16, 1976	B 384,654	331/94.5M	Feb. 24, 1976
B 276,026	260/326.5B	Feb. 3, 1976	B 385,024	260/306.7C	Feb. 10, 1976
B 279,415	102/38	Mar. 16, 1976	B 385,483	260/471R	Feb. 17, 1976
B 279,969	313/477	Jan. 13, 1976	B 385,631	75/.5BA	Jan. 27, 1976
B 281,162	357/15	Mar. 23, 1976	B 386,257	260/557R	Feb. 3, 1976
B 283,941	360/15	Feb. 3, 1976	B 386,673	260/942	Feb. 3, 1976
B 288,757	156/461	Mar. 30, 1976	B 386,828	260/516	Feb. 3, 1976
B 301,143	260/534R	Jan. 27, 1976	B 387,337	D9/255	Mar. 16, 1976
B 302,160	260/346.2M	Feb. 3, 1976	B 388,521	260/471R	Jan. 13, 1976
B 306,668	260/77.5CR	Feb. 3, 1976	B 388,675	260/873	Mar. 30, 1976
B 307,698	424/267	Feb. 3, 1976	B 389,155	8/178R	Mar. 30, 1976
B 308,659	264/36	Jan. 27, 1976	B 389,304	8/115.7	Jan. 27, 1976
B 311,450	99/485	Mar. 9, 1976	B 389,605	426/561	Mar. 23, 1976
B 311,779	106/309	Feb. 10, 1976	B 390,031	260/515A	Jan. 13, 1976
B 313,280	285/110	Apr. 6, 1976	B 390,408	260/448.2H	Feb. 3, 1976
B 326,211	260/220B	Mar. 23, 1976	B 390,979	252/455R	Mar. 23, 1976
B 328,065	202/185A	Mar. 30, 1976	B 391,473	260/553R	Mar. 2, 1976
B 328,077	260/112R	Apr. 13, 1976	B 391,797	308/9	Mar. 9, 1976
B 328,116	165/4	Mar. 9, 1976	B 391,828	260/563R	Apr. 6, 1976
B 330,719	210/512R	Mar. 16, 1976	B 391,844	340/172.5	Mar. 16, 1976
B 330,736	260/648F	Feb. 3, 1976	B 392,798	260/346.3	Mar. 30, 1976
B 332,442	260/248.5	Mar. 30, 1976	B 394,248	260/647	Jan. 27, 1976
B 333,110	428/132	Mar. 16, 1976	B 394,350	331/94.5P	Jan. 13, 1976
B 333,247	260/117	Mar. 16, 1976	B 394,742	426/8	Apr. 13, 1976
B 333,838	426/594	Mar. 23, 1976	B 395,554	101/115	Mar. 9, 1976
B 335,783	264/11	Mar. 30, 1976	B 395,975	195/68	Mar. 2, 1976
B 336,754	423/462	Mar. 16, 1976	B 396,164	176/68	Feb. 3, 1976
B 337,023	215/347	Mar. 30, 1976	B 396,377	D8/50	Apr. 6, 1976
B 337,823	424/243	Mar. 23, 1976	B 396,916	164/282	Mar. 2, 1976
B 339,194	333/73W	Feb. 3, 1976	B 397,674	259/191	Mar. 16, 1976
B 339,446	156/159	Feb. 24, 1976	B 398,084	260/326R	Feb. 3, 1976
B 340,170	317/18D	Mar. 30, 1976	B 398,220	431/264	Feb. 3, 1976
B 344,669	260/249.6	Mar. 16, 1976	B 398,488	248/49	Feb. 24, 1976
B 344,967	8/174	Feb. 3, 1976	B 399,098	424/246	Feb. 24, 1976
B 347,661	360/35	Mar. 16, 1976	B 399,632	136/205	Mar. 9, 1976
B 348,433	260/244R	Feb. 3, 1976	B 399,908	178/58R	Jan. 13, 1976
B 349,370	260/239A	Jan. 27, 1976	B 400,871	60/445	Feb. 17, 1976
B 351,455	260/493	Feb. 24, 1976	B 401,042	D6/177	Mar. 16, 1976
B 354,222	204/162R	Mar. 23, 1976	B 401,221	210/114	Apr. 6, 1976
B 354,959	8/74	Feb. 17, 1976	B 402,162	260/288R	Mar. 2, 1976
B 356,187	86/1R	Jan. 20, 1976	B 402,328	101/19	Apr. 6, 1976
B 356,470	210/84	Mar. 23, 1976	B 402,553	423/249	Feb. 17, 1976
B 357,526	260/545R	Mar. 23, 1976	B 402,657	260/288CF	Apr. 6, 1976
B 358,260	260/29.7PT	Mar. 30, 1976	B 402,929	428/289	Feb. 3, 1976
B 358,427	179/1SB	Feb. 3, 1976	B 403,076	260/465E	Apr. 20, 1976
B 359,768	26/347.3	Mar. 30, 1976	B 403,243	260/293.79	Mar. 30, 1976
B 359,901	96/36.1	Jan. 13, 1976	B 403,326	260/239BC	Mar. 23, 1976
B 361,954	203/1	Apr. 6, 1976	B 403,477	360/80	Feb. 3, 1976
B 363,465	280/150SB	Mar. 30, 1976	B 403,507	219/273	Feb. 10, 1976

DOCUMENT NUMBER	CLASS/ SUBCLASS	PUBLISHED DATE	DOCUMENT NUMBER	CLASS/ SUBCLASS	PUBLISHED DATE
B 403,766	252/543	Feb. 10, 1976	B 432,265	106/213	Mar. 23, 1976
B 403,883	428/469	Mar. 23, 1976	B 432,594	137/627.5	Mar. 30, 1976
B 405,726	102/32	Jan. 13, 1976	B 432,969	180/44F	Mar. 2, 1976
B 405,899	123/119A	Mar. 23, 1976	B 432,991	100/162B	Mar. 2, 1976
B 406,546	D6/114	Mar. 16, 1976	B 433,094	180/49	Jan. 27, 1976
B 407,014	260/309.2	Mar. 16, 1976	B 433,707	252/544	Mar. 23, 1976
B 407,205	8/1E	Mar. 16, 1976	B 433,892	204/192	Apr. 6, 1976
B 407,737	424/267	Feb. 3, 1976	B 433,930	210/500M	Mar. 23, 1976
B 407,812	44/62	Mar. 23, 1976	B 434,206	404/77	Feb. 3, 1976
B 408,123	260/293.84	Apr. 13, 1976	B 434,441	D12/85	Mar. 16, 1976
B 409,310	260/615A	Mar. 23, 1976	B 435,481	271/180	Mar. 9, 1976
B 409,848	427/372	Jan. 27, 1976	B 435,570	280/11.35R	Mar. 16, 1976
B 410,074	260/483	Feb. 24, 1976	B 435,617	260/256.4C	Mar. 16, 1976
B 410,694	91/40	Mar. 23, 1976	B 436,724	187/1R	Feb. 24, 1976
B 411,471	75/156.5	Feb. 17, 1976	B 437,209	260/78.5R	Feb. 3, 1976
B 411,624	260/156	Mar. 16, 1976	B 437,559	254/188	Feb. 3, 1976
B 411,765	425/521	Feb. 24, 1976	B 437,596	208/15	Jan. 27, 1976
B 412,023	318/574	Apr. 6, 1976	B 437,894	96/33	Mar. 2, 1976
B 412,068	102/69	Jan. 13, 1976	B 437,986	178/6	Apr. 20, 1976
B 412,124	431/1	Mar. 23, 1976	B 438,048	424/70	Mar. 23, 1976
B 412,830	260/448.2N	Mar. 30, 1976	B 438,484	260/586C	Feb. 17, 1976
B 413,379	260/562B	Mar. 9, 1976	B 438,882	66/116	Feb. 24, 1976
B 414,028	423/448	Feb. 17, 1976	B 438,916	208/253	Jan. 13, 1976
B 414,266	260/29.2TN	Feb. 10, 1976	B 439,542	330/33	Jan. 27, 1976
B 414,481	156/73.6	Jan. 20, 1976	B 439,778	426/548	Feb. 3, 1976
B 414,971	D7/154	Feb. 10, 1976	B 440,548	260/325PH	Mar. 16, 1976
B 415,021	73/432R	Mar. 2, 1976	B 440,632	260/831	Apr. 13, 1976
B 415,122	260/42.15	Feb. 10, 1976	B 440,633	260/47EP	Feb. 10, 1976
B 415,590	428/378	Mar. 23, 1976	B 440,858	260/346.2M	Feb. 3, 1976
B 416,257	260/591	Mar. 16, 1976	B 441,543	203/73	Mar. 23, 1976
B 416,589	101/129	Jan. 27, 1976	B 441,605	260/37EP	Feb. 3, 1976
B 417,014	260/88.2C	Jan. 13, 1976	B 441,723	252/33.6	Mar. 16, 1976
B 417,164	264/49	Mar. 2, 1976	B 441,789	426/332	Mar. 30, 1976
B 417,349	102/39	Mar. 9, 1976	B 442,163	D6/40	Mar. 16, 1976
B 417,498	96/66.3	Mar. 23, 1976	B 442,295	331/94.5G	Mar. 16, 1976
B 418,489	195/29	Jan. 13, 1976	B 442,431	260/514J	Mar. 23, 1976
B 419,173	244/140	Mar. 9, 1976	B 442,810	260/243C	Feb. 24, 1976
B 419,364	15/53A	Mar. 30, 1976	B 442,866	43/129	Feb. 24, 1976
B 419,582	260/143	Mar. 2, 1976	B 442,953	260/408	Mar. 23, 1976
B 420,176	96/35.1	Mar. 16, 1976	B 442,970	178/7.3D	Feb. 3, 1976
B 420,321	242/25A	Mar. 30, 1976	B 443,163	102/42R	Feb. 3, 1976
B 420,472	317/101A	Feb. 24, 1976	B 443,446	D86/10	Apr. 6, 1976
B 421,373	260/566R	Mar. 23, 1976	B 443,563	260/82.1	Feb. 24, 1976
B 421,608	427/54	Mar. 23, 1976	B 443,647	296/35R	Feb. 17, 1976
B 421,975	29/180SS	Mar. 2, 1976	B 443,712	340/174DC	Jan. 27, 1976
B 422,063	260/2.5AM	Feb. 3, 1976	B 444,078	260/47EQ	Mar. 23, 1976
B 422,156	315/379	Mar. 23, 1976	B 444,294	260/167	Mar. 30, 1976
B 423,365	260/37EP	Feb. 17, 1976	B 444,437	307/205	Mar. 9, 1976
B 423,404	204/159.22	Mar. 2, 1976	B 445,166	260/294.8G	Mar. 2, 1976
B 423,441	244/169	Feb. 17, 1976	B 445,459	60/226A	Feb. 3, 1976
B 423,867	8/142	Feb. 3, 1976	B 445,493	260/290R	Mar. 2, 1976
B 423,883	96/1R	Jan. 27, 1976	B 445,690	152/213R	Feb. 3, 1976
B 424,354	D7/15	Feb. 10, 1976	B 446,107	260/326.12R	Mar. 9, 1976
B 424,410	8/21A	Mar. 30, 1976	B 446,956	204/129.43	Apr. 13, 1976
B 424,989	198/179	Feb. 3, 1976	B 447,000	260/293.56	Feb. 3, 1976
B 425,193	92/163	Mar. 23, 1976	B 447,440	123/25R	Feb. 17, 1976
B 425,285	71/67	Apr. 13, 1976	B 449,837	260/578	Mar. 2, 1976
B 425,462	241/81	Mar. 9, 1976	B 449,892	360/137	Mar. 23, 1976
B 425,588	123/32ST	Jan. 13, 1976	B 449,988	210/199	Mar. 30, 1976
B 426,157	260/535P	Mar. 23, 1976	B 449,989	210/168	Mar. 30, 1976
B 426,227	219/69M	Mar. 2, 1976	B 450,196	428/341	Feb. 10, 1976
B 426,266	260/314.5	Mar. 2, 1976	B 450,413	346/75	Mar. 23, 1976
B 426,274	260/674SA	Jan. 20, 1976	B 450,521	356/201	Feb. 17, 1976
B 426,424	424/9	Feb. 3, 1976	B 450,693	260/397.4	Mar. 9, 1976
B 426,639	424/258	Feb. 3, 1976	B 450,701	260/345.9	Mar. 16, 1976
B 426,802	260/293.57	Feb. 17, 1976	B 450,708	260/345.9	Mar. 9, 1976
B 426,819	277/184	Feb. 17, 1976	B 450,870	424/251	Mar. 16, 1976
B 427,883	360/27	Jan. 20, 1976	B 450,967	252/454	Jan. 13, 1976
B 427,946	260/325R	Mar. 23, 1976	B 451,248	219/201	Mar. 2, 1976
B 428,103	260/683.15D	Feb. 10, 1976	B 451,308	260/78S	Feb. 17, 1976
B 428,271	340/172.5	Mar. 23, 1976	B 451,396	318/481	Apr. 13, 1976
B 428,386	423/249	Mar. 23, 1976	B 451,438	424/1	Mar. 2, 1976
B 428,408	340/146.1AB	Mar. 2, 1976	B 451,534	250/402	Jan. 13, 1976
B 428,877	200/83SA	Jan. 27, 1976	B 452,034	296/137A	Mar. 23, 1976
B 429,018	340/174TF	Feb. 10, 1976	B 452,138	340/172.5	Mar. 23, 1976
B 429,027	260/296R	Mar. 23, 1976	B 452,293	156/167	Mar. 30, 1976
B 429,157	229/62.5	Jan. 27, 1976	B 452,501	210/24	Mar. 16, 1976
B 429,434	251/58	Feb. 17, 1976	B 452,672	404/71	Jan. 13, 1976
B 430,157	260/668D	Feb. 17, 1976	B 452,879	195/103.5R	Mar. 16, 1976
B 430,172	137/798	Jan. 13, 1976	B 452,883	106/27	Jan. 27, 1976
B 430,213	195/68	Mar. 30, 1976	B 452,915	318/467	Mar. 30, 1976
B 430,276	323/1	Jan. 20, 1976	B 452,938	75/101BE	Feb. 17, 1976
B 430,287	D83/1N	Feb. 10, 1976	B 452,944	198/25	Mar. 30, 1976
B 430,326	277/34.6	Mar. 23, 1976	B 453,031	156/3	Mar. 16, 1976
B 430,334	8/10.2	Jan. 27, 1976	B 453,067	340/173LM	Mar. 23, 1976
B 431,072	162/133	Jan. 20, 1976	B 453,238	214/1C	Mar. 2, 1976
B 431,334	425/237	Mar. 16, 1976	B 453,432	360/60	Mar. 16, 1976
B 431,713	260/378	Feb. 10, 1976	B 453,533	200/84C	Feb. 17, 1976
B 431,785	23/273SP	Feb. 24, 1976	B 453,616	333/30R	Jan. 27, 1976
B 431,797	426/594	Mar. 30, 1976	B 453,759	264/225	Jan. 27, 1976
B 432,049	179/90K	Mar. 23, 1976	B 453,960	96/75	Apr. 13, 1976
B 432,140	340/172.5	Mar. 23, 1976	B 454,283	240/41.35R	Feb. 3, 1976

DOCUMENT NUMBER	CLASS/ SUBCLASS	PUBLISHED DATE
B 454,833	137/220	Mar. 30, 1976
B 455,425	340/174TF	Feb. 3, 1976
B 455,481	260/429.9	Feb. 24, 1976
B 455,486	260/984	Mar. 16, 1976
B 455,686	260/29.2EP	Mar. 2, 1976
B 455,759	96/45	Feb. 24, 1976
B 455,806	264/150	Mar. 23, 1976
B 456,069	428/447	Mar. 9, 1976
B 456,148	156/71	Jan. 13, 1976
B 456,153	40/159	Mar. 9, 1976
B 456,384	260/88.2B	Apr. 6, 1976
B 456,579	260/884	Feb. 10, 1976
B 456,869	260/326.13R	Mar. 9, 1976
B 456,900	260/465.9	Feb. 3, 1976
B 456,905	55/70	Mar. 23, 1976
B 457,547	427/145	Feb. 17, 1976
B 457,850	252/429R	Feb. 10, 1976
B 457,862	424/311	Jan. 27, 1976
B 457,886	428/434	Jan. 13, 1976
B 457,931	260/247.1R	Mar. 16, 1976
B 458,010	324/83D	Mar. 16, 1976
B 458,060	8/17	Jan. 13, 1976
B 458,500	310/90	Feb. 24, 1976
B 458,617	260/295.5B	Feb. 3, 1976
B 458,819	252/545	Apr. 13, 1976
B 458,964	360/102	Mar. 2, 1976
B 459,190	150/8	Mar. 30, 1976
B 459,381	148/36	Mar. 9, 1976
B 459,408	424/273	Mar. 23, 1976
B 459,597	52/207	Feb. 17, 1976
B 459,811	323/17	Jan. 20, 1976
B 459,821	428/537	Mar. 30, 1976
B 460,388	8/14	Jan. 27, 1976
B 460,441	260/2.5AC	Jan. 13, 1976
B 460,846	260/665R	Feb. 24, 1976
B 461,184	260/876R	Feb. 17, 1976
B 461,250	150/3	Mar. 16, 1976
B 461,257	229/17R	Jan. 13, 1976
B 461,336	340/172.5	Feb. 3, 1976
B 461,352	8/161	Jan. 13, 1976
B 461,685	260/283CN	Mar. 30, 1976
B 461,752	340/172.5	Apr. 20, 1976
B 461,874	360/17	Jan. 27, 1976
B 462,030	179/2DP	Mar. 23, 1976
B 462,386	156/143	Jan. 13, 1976
B 462,424	204/9	Feb. 24, 1976
B 462,828	241/46.11	Mar. 9, 1976
B 462,893	96/35.1	Feb. 24, 1976
B 463,322	315/169TV	Jan. 20, 1976
B 463,388	219/233	Feb. 10, 1976
B 463,473	73/302	Mar. 23, 1976
B 463,591	428/523	Mar. 30, 1976
B 463,671	296/35R	Jan. 13, 1976
B 464,027	60/667	Mar. 16, 1976
B 464,290	73/302	Feb. 3, 1976
B 464,491	132/7	Mar. 30, 1976
B 464,587	260/429.7	Feb. 3, 1976
B 464,593	424/62	Mar. 9, 1976
B 465,195	60/592	Jan. 27, 1976
B 465,202	260/598	Feb. 24, 1976
B 465,376	428/418	Apr. 13, 1976
B 465,393	324/62	Jan. 27, 1976
B 465,688	260/873	Jan. 27, 1976
B 465,955	260/37R	Feb. 3, 1976
B 466,304	203/59	Mar. 23, 1976
B 466,318	322/25	Mar. 9, 1976
B 466,390	200/339	Feb. 24, 1976
B 466,419	106/1	Mar. 23, 1976
B 466,444	307/137	Jan. 20, 1976
B 466,906	123/191S	Mar. 16, 1976
B 466,929	424/263	Jan. 27, 1976
B 467,250	208/78	Feb. 3, 1976
B 467,328	260/527R	Mar. 9, 1976
B 467,412	116/124.4	Jan. 13, 1976
B 467,486	123/32SP	Mar. 16, 1976
B 467,971	315/399	Jan. 13, 1976
B 468,052	260/247.7T	Feb. 10, 1976
B 468,100	178/7.1	Mar. 9, 1976
B 468,330	428/175	Mar. 16, 1976
B 468,350	260/593R	Jan. 13, 1976
B 468,421	162/274	Mar. 30, 1976
B 468,603	252/25	Mar. 23, 1976
B 469,036	350/7	Mar. 16, 1976
B 469,228	116/124L	Feb. 17, 1976
B 469,468	260/878R	Mar. 16, 1976
B 469,947	350/173	Jan. 20, 1976
B 470,170	74/527	Jan. 13, 1976
B 470,305	360/137	Apr. 6, 1976
B 470,348	260/621K	Jan. 13, 1976
B 470,576	260/63UY	Feb. 24, 1976
B 470,601	210/321A	Mar. 9, 1976
B 470,798	357/65	Jan. 20, 1976
B 470,853	89/142	Mar. 23, 1976
B 470,899	200/309	Mar. 2, 1976
B 470,900	260/239B	Mar. 2, 1976
B 470,945	260/33.6AQ	Apr. 13, 1976
B 471,116	260/544C	Feb. 17, 1976
B 471,221	423/315	Jan. 13, 1976
B 471,405	252/182	Feb. 10, 1976
B 471,494	260/308R	Mar. 16, 1976
B 471,579	260/2.5R	Jan. 13, 1976
B 471,617	260/112.5R	Feb. 10, 1976
B 471,681	33/252	Apr. 13, 1976
B 471,706	280/124F	Mar. 16, 1976
B 471,735	415/14	Feb. 3, 1976
B 471,836	260/307H	Feb. 24, 1976
B 472,241	260/604HF	Feb. 17, 1976
B 472,256	260/472	Jan. 13, 1976
B 472,276	340/174TF	Mar. 9, 1976
B 472,284	179/81R	Jan. 13, 1976
B 472,591	114/.5A	Apr. 6, 1976
B 472,760	260/570.6	Apr. 13, 1976
B 473,039	260/243C	Feb. 10, 1976
B 473,040	260/243C	Feb. 10, 1976
B 473,813	141/294	Mar. 9, 1976
B 473,972	228/190	Jan. 13, 1976
B 474,573	260/609E	Jan. 20, 1976
B 474,645	260/77.5AN	Mar. 2, 1976
B 474,747	428/515	Feb. 24, 1976
B 475,236	318/139	Feb. 3, 1976
B 475,385	156/435	Mar. 9, 1976
B 475,681	179/1CN	Jan. 20, 1976
B 475,801	318/98	Mar. 30, 1976
B 476,267	260/157	Apr. 6, 1976
B 476,372	260/340.9	Feb. 24, 1976
B 476,542	208/323	Mar. 30, 1976
B 476,568	84/1.01	Mar. 16, 1976
B 476,577	179/1SM	Jan. 20, 1976
B 476,681	340/174TF	Jan. 13, 1976
B 476,776	204/159.16	Mar. 23, 1976
B 476,837	427/39	Jan. 20, 1976
B 476,967	318/593	Mar. 9, 1976
B 477,252	260/296R	Jan. 13, 1976
B 477,481	260/326.9	Feb. 3, 1976
B 477,584	D19/49	Apr. 6, 1976
B 477,597	290/17	Feb. 17, 1976
B 477,892	235/61.11E	Mar. 30, 1976
B 478,234	325/38A	Mar. 30, 1976
B 478,739	162/290	Feb. 17, 1976
B 478,759	426/656	Mar. 16, 1976
B 479,175	260/33.6R	Feb. 17, 1976
B 479,242	252/500	Feb. 17, 1976
B 479,502	219/121EM	Mar. 16, 1976
B 479,556	260/45.8R	Mar. 23, 1976
B 479,681	D6/94	Mar. 16, 1976
B 479,969	252/105	Mar. 9, 1976
B 480,114	260/567.6M	Mar. 2, 1976
B 480,251	123/139AW	Mar. 23, 1976
B 480,287	106/58	Mar. 30, 1976
B 480,292	357/55	Mar. 16, 1976
B 480,350	73/190R	Feb. 10, 1976
B 480,384	251/28	Mar. 23, 1976
B 480,452	260/327C	Feb. 10, 1976
B 480,473	123/148E	Mar. 2, 1976
B 480,591	156/220	Mar. 30, 1976
B 480,604	214/152	Jan. 13, 1976
B 480,625	260/251A	Feb. 24, 1976
B 480,662	260/643R	Mar. 2, 1976
B 480,702	261/98	Jan. 27, 1976
B 480,740	200/16C	Mar. 2, 1976
B 480,749	357/22	Mar. 9, 1976
B 480,987	426/656	Mar. 30, 1976
B 481,048	355/16	Mar. 16, 1976
B 481,190	96/50PT	Mar. 30, 1976
B 481,600	101/93.14	Jan. 27, 1976
B 481,737	428/73	Jan. 13, 1976
B 481,778	423/573G	Mar. 30, 1976
B 481,930	357/72	Feb. 24, 1976
B 481,989	426/281	Mar. 23, 1976
B 482,058	424/122	Mar. 2, 1976
B 482,660	424/115	Feb. 10, 1976
B 482,709	260/240G	Feb. 24, 1976
B 482,907	340/172.5	Jan. 20, 1976
B 483,247	360/104	Apr. 13, 1976
B 483,256	75/165	Feb. 10, 1976
B 483,268	324/158R	Mar. 9, 1976
B 483,606	260/2.5AR	Jan. 27, 1976
B 483,615	315/371	Jan. 27, 1976
B 483,746	260/479C	Mar. 23, 1976
B 483,762	260/2.5AW	Feb. 10, 1976
B 483,865	260/23XA	Jan. 13, 1976
B 484,029	343/7.7	Feb. 10, 1976
B 484,067	260/240A	Feb. 17, 1976
B 484,068	260/397.4	Mar. 2, 1976

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B 484,121	235/152	Mar. 16, 1976
B 484,269	260/326.5FN	Feb. 10, 1976
B 484,332	144/32R	Mar. 2, 1976
B 484,365	360/1	Jan. 27, 1976
B 484,419	260/456NS	Mar. 9, 1976
B 484,437	260/927N	Mar. 30, 1976
B 484,482	360/98	Mar. 23, 1976
B 484,769	114/230	Mar. 16, 1976
B 485,051	260/346.4	Feb. 17, 1976
B 485,060	260/30.4R	Feb. 17, 1976
B 485,169	264/315	Mar. 16, 1976
B 485,188	260/40P	Mar. 16, 1976
B 485,401	423/238	Jan. 27, 1976
B 485,575	340/172.5	Feb. 24, 1976
B 485,926	250/310	Mar. 23, 1976
B 485,972	260/112.5R	Mar. 23, 1976
B 486,280	260/307D	Feb. 3, 1976
B 486,614	259/4	Feb. 17, 1976
B 486,678	260/326R	Mar. 2, 1976
B 486,828	260/2.5AW	Mar. 2, 1976
B 487,062	D26/5C	Feb. 10, 1976
B 487,078	57/77.4	Mar. 30, 1976
B 487,133	424/230	Jan. 27, 1976
B 487,260	222/136	Jan. 27, 1976
B 487,411	360/78	Feb. 24, 1976
B 487,423	260/239D	Mar. 2, 1976
B 487,427	242/107.4A	Mar. 2, 1976
B 487,467	260/33.4R	Apr. 13, 1976
B 487,529	260/45.75H	Mar. 30, 1976
B 488,111	260/308A	Jan. 13, 1976
B 488,395	343/100LE	Jan. 27, 1976
B 488,634	317/9R	Jan. 20, 1976
B 488,756	164/57	Mar. 16, 1976
B 488,836	165/162	Mar. 30, 1976
B 489,290	72/56	Feb. 17, 1976
B 489,328	354/298	Jan. 20, 1976
B 489,331	260/28P	Feb. 17, 1976
B 489,485	D34/15AJ	Apr. 13, 1976
B 489,526	338/166	Feb. 3, 1976
B 489,550	114/67A	Mar. 16, 1976
B 489,685	254/190R	Feb. 24, 1976
B 490,067	206/455	Jan. 27, 1976
B 490,547	73/422GC	Feb. 24, 1976
B 490,551	D12/146	Apr. 6, 1976
B 490,589	251/319	Feb. 3, 1976
B 490,623	137/608	Mar. 2, 1976
B 490,647	180/103	Feb. 24, 1976
B 490,806	55/105	Feb. 3, 1976
B 490,812	260/326.5B	Mar. 30, 1976
B 490,946	260/268BF	Feb. 17, 1976
B 490,995	424/177	Feb. 3, 1976
B 491,032	260/343.2R	Feb. 10, 1976
B 491,052	260/472	Mar. 2, 1976
B 491,111	360/60	Feb. 17, 1976
B 491,455	423/393	Feb. 3, 1976
B 491,501	32/10A	Jan. 13, 1976
B 491,618	281/25R	Mar. 16, 1976
B 491,650	235/151	Mar. 9, 1976
B 491,673	162/5	Feb. 17, 1976
B 491,711	260/240R	Mar. 23, 1976
B 491,774	60/39.63	Mar. 30, 1976
B 491,776	47/1.7	Mar. 16, 1976
B 491,883	260/250BC	Feb. 3, 1976
B 491,906	D9/71	Feb. 10, 1976
B 492,039	260/287C	Feb. 24, 1976
B 492,093	356/110	Mar. 23, 1976
B 492,120	166/224	Feb. 24, 1976
B 492,301	29/580	Jan. 13, 1976
B 492,373	242/36	Mar. 30, 1976
B 492,688	307/255	Jan. 20, 1976
B 492,716	210/189	Mar. 2, 1976
B 492,774	354/23D	Mar. 9, 1976
B 492,902	174/52R	Feb. 24, 1976
B 492,946	235/151.34	Jan. 27, 1976
B 493,254	D34/15AJ	Apr. 13, 1976
B 493,370	333/81A	Mar. 16, 1976
B 493,463	195/31R	Mar. 23, 1976
B 493,474	210/500M	Mar. 23, 1976
B 493,501	355/17	Feb. 3, 1976
B 493,537	260/47UP	Mar. 23, 1976
B 493,686	426/281	Mar. 23, 1976
B 493,950	426/73	Mar. 2, 1976
B 493,955	424/245	Mar. 9, 1976
B 493,981	40/28C	Mar. 9, 1976
B 494,138	260/514D	Mar. 23, 1976
B 494,167	56/13.4	Mar. 23, 1976
B 494,234	101/401.3	Feb. 10, 1976
B 494,339	260/294.9	Mar. 16, 1976
B 494,383	200/38FA	Feb. 3, 1976
B 494,439	260/29.6HN	Apr. 13, 1976
B 494,440	260/29.6N	Feb. 17, 1976
B 494,450	260/29.6TA	Feb. 17, 1976
B 494,669	260/513R	Feb. 3, 1976
B 494,691	343/840	Mar. 16, 1976
B 494,806	248/73	Feb. 3, 1976
B 494,944	260/674SA	Feb. 17, 1976
B 495,124	57/140BY	Mar. 9, 1976
B 495,185	340/173FF	Mar. 9, 1976
B 495,331	324/15	Mar. 16, 1976
B 495,402	198/38	Feb. 17, 1976
B 495,408	260/890	Feb. 3, 1976
B 495,489	424/362	Feb. 3, 1976
B 495,550	260/343.3R	Feb. 3, 1976
B 495,554	260/343.3R	Feb. 3, 1976
B 495,759	321/61	Feb. 13, 1976
B 495,781	260/448R	Mar. 23, 1976
B 495,903	8/84	Feb. 17, 1976
B 496,430	260/940	Feb. 10, 1976
B 496,431	424/274	Jan. 13, 1976
B 496,487	357/16	Jan. 20, 1976
B 496,500	179/15AL	Feb. 3, 1976
B 496,502	343/100LE	Jan. 20, 1976
B 496,792	44/2	Feb. 17, 1976
B 496,964	360/92	Apr. 20, 1976
B 496,999	101/93.13	Jan. 27, 1976
B 497,021	74/481	Jan. 13, 1976
B 497,194	260/2.5AC	Feb. 3, 1976
B 497,292	28/1.6	Feb. 3, 1976
B 497,293	179/15BA	Mar. 30, 1976
B 497,473	8/14	Feb. 3, 1976
B 497,490	260/78UA	Mar. 23, 1976
B 497,571	8/169	Mar. 23, 1976
B 497,584	156/66	Feb. 24, 1976
B 497,702	343/8	Mar. 2, 1976
B 497,780	260/33.8UA	Feb. 24, 1976
B 497,853	222/43	Feb. 17, 1976
B 497,896	D26/14A	Apr. 6, 1976
B 497,960	307/27	Jan. 20, 1976
B 498,205	204/159.18	Feb. 10, 1976
B 498,208	428/411	Apr. 13, 1976
B 498,288	260/250P	Mar. 23, 1976
B 498,500	340/347CC	Jan. 20, 1976
B 498,775	178/66R	Mar. 2, 1976
B 498,820	33/174S	Mar. 9, 1976
B 498,951	123/122AC	Mar. 2, 1976
B 499,171	180/5R	Jan. 27, 1976
B 499,209	299/31	Feb. 24, 1976
B 499,227	164/26	Jan. 27, 1976
B 499,324	423/244	Mar. 16, 1976
B 499,352	198/202	Jan. 27, 1976
B 499,370	208/93	Mar. 30, 1976
B 499,718	340/174TF	Jan. 27, 1976
B 499,786	74/424.8VA	Mar. 16, 1976
B 500,171	355/11	Mar. 30, 1976
B 500,176	360/81	Feb. 3, 1976
B 500,408	D26/5C	Mar. 16, 1976
B 500,945	74/765	Feb. 24, 1976
B 500,959	260/45.8NZ	Apr. 13, 1976
B 500,981	250/291	Jan. 27, 1976
B 501,122	197/17	Feb. 17, 1976
B 501,128	260/621H	Feb. 24, 1976
B 501,181	323/22T	Feb. 10, 1976
B 501,253	360/85	Feb. 3, 1976
B 501,317	208/210	Jan. 13, 1976
B 501,379	428/412	Mar. 30, 1976
B 501,415	427/207	Jan. 13, 1976
B 501,482	310/9.6	Jan. 13, 1976
B 501,503	315/241P	Mar. 2, 1976
B 501,540	260/28.5AS	Jan. 13, 1976
B 501,975	74/18.2	Mar. 2, 1976
B 501,993	408/124	Jan. 13, 1976
B 502,151	55/417	Mar. 23, 1976
B 502,161	354,174	Mar. 2, 1976
B 502,289	358/41	Jan. 13, 1976
B 502,381	D10/69	Mar. 16, 1976
B 502,540	60/304	Jan. 13, 1976
B 502,571	D9/193	Apr. 6, 1976
B 502,589	260/2.5AR	Jan. 27, 1976
B 502,652	236/13	Feb. 24, 1976
B 502,667	15/147A	Feb. 24, 1976
B 502,773	106/57	Jan. 13, 1976
B 502,973	318/257	Jan. 27, 1976
B 502,993	260/929	Feb. 17, 1976
B 503,029	96/78	Jan. 27, 1976
B 503,345	260/256.4Q	Feb. 24, 1976
B 503,371	307/251	Mar. 30, 1976
B 503,436	29/237	Feb. 24, 1976
B 503,456	114/230	Mar. 23, 1976
B 503,521	198/129	Mar. 16, 1976
B 503,579	260/140R	Feb. 10, 1976
B 503,618	250/231SE	Mar. 9, 1976
B 503,742	260/580	Feb. 17, 1976
B 503,776	106/316	Mar. 23, 1976
B 503,780	340/172.5	Mar. 16, 1976

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B 503,817	260/112.5R	Jan. 13, 1976
B 504,056	313/330	Feb. 24, 1976
B 504,061	29/415	Mar. 16, 1976
B 504,156	235/151.12	Mar. 23, 1976
B 504,404	317/36TD	Feb. 24, 1976
B 504,405	317/36TD	Apr. 13, 1976
B 504,439	61/49	Mar. 16, 1976
B 504,503	357/23	Mar. 9, 1976
B 504,582	260/543F	Mar. 30, 1976
B 504,778	226/21	Feb. 24, 1976
B 504,877	260/340.5	Feb. 24, 1976
B 504,899	179/1.5FS	Mar. 9, 1976
B 505,126	136/86R	Feb. 10, 1976
B 505,221	260/80.73	Mar. 30, 1976
B 505,582	318/119	Mar. 23, 1976
B 505,689	60/690	Mar. 2, 1976
B 505,813	160/229R	Jan. 13, 1976
B 506,144	264/51	Feb. 10, 1976
B 506,148	260/239.3A	Feb. 3, 1976
B 506,167	242/129.8	Feb. 10, 1976
B 506,169	84/275	Jan. 13, 1976
B 506,286	200/61.41	Jan. 20, 1976
B 506,461	317/259	Jan. 20, 1976
B 506,566	305/27	Jan. 20, 1976
B 506,624	226/1	Mar. 9, 1976
B 506,648	260/45.8N	Feb. 3, 1976
B 506,744	73/24	Jan. 13, 1976
B 506,760	29/591	Apr. 13, 1976
B 506,839	340/172.5	Mar. 23, 1976
B 506,840	307/251	Mar. 23, 1976
B 506,916	331/94.5L	Feb. 3, 1976
B 506,926	226/68	Feb. 17, 1976
B 507,087	332/9R	Feb. 17, 1976
B 507,131	354/156	Mar. 2, 1976
B 507,166	162/258	Apr. 13, 1976
B 507,396	250/577	Feb. 10, 1976
B 507,456	260/28R	Mar. 9, 1976
B 507,476	8/62	Feb. 10, 1976
B 507,647	340/347AD	Jan. 27, 1976
B 507,661	308/207R	Mar. 2, 1976
B 508,118	208/59	Feb. 17, 1976
B 508,119	208/208R	Feb. 17, 1976
B 508,369	264/51	Jan. 13, 1976
B 508,639	317/100	Mar. 23, 1976
B 508,817	178/7.5R	Feb. 3, 1976
B 508,878	53/77	Feb. 3, 1976
B 508,940	137/255	Feb. 17, 1976
B 508,961	357/36	Feb. 3, 1976
B 509,043	64/27L	Feb. 24, 1976
B 509,165	335/7	Mar. 2, 1976
B 509,185	321/7	Feb. 3, 1976
B 509,238	60/706	Feb. 24, 1976
B 509,474	355/8	Feb. 17, 1976
B 509,586	74/479	Feb. 3, 1976
B 509,606	317/120	Feb. 3, 1976
B 509,640	252/432	Feb. 17, 1976
B 509,772	174/68.5	Mar. 16, 1976
B 509,819	136/138	Apr. 13, 1976
B 510,026	73/362AR	Apr. 13, 1976
B 510,184	D12/143	Apr. 6, 1976
B 510,278	403/341	Mar. 30, 1976
B 510,281	221/75	Mar. 9, 1976
B 510,346	D7/131	Feb. 10, 1976
B 510,458	260/880B	Feb. 10, 1976
B 510,521	244/3.27	Mar. 2, 1976
B 510,588	298/35M	Jan. 27, 1976
B 510,677	136/89	Feb. 24, 1976
B 510,682	23/277R	Mar. 30, 1976
B 510,836	424/219	Mar. 23, 1976
B 510,850	424/317	Feb. 3, 1976
B 510,855	29/127	Jan. 27, 1976
B 510,957	424/326	Mar. 30, 1976
B 510,998	260/17R	Feb. 10, 1976
B 511,002	204/195P	Mar. 2, 1976
B 511,099	37/142A	Feb. 3, 1976
B 511,156	166/311	Jan. 27, 1976
B 511,346	244/169	Jan. 27, 1976
B 511,407	254/186R	Feb. 10, 1976
B 511,454	35/36	Feb. 24, 1976
B 511,665	136/26	Mar. 2, 1976
B 511,885	164/60	Jan. 27, 1976
B 511,886	318/231	Feb. 3, 1976
B 511,907	180/108	Mar. 30, 1976
B 511,909	73/61.1R	Feb. 17, 1976
B 512,324	110/8R	Feb. 17, 1976
B 512,373	260/937	Feb. 10, 1976
B 512,547	415/213R	Jan. 13, 1976
B 512,745	126/271	Jan. 13, 1976
B 512,779	260/326E	Apr. 13, 1976
B 512,818	136/6LF	Apr. 6, 1976
B 512,849	307/296	Feb. 3, 1976
B 512,964	346/75	Feb. 10, 1976
B 513,014	260/566A	Feb. 10, 1976
B 513,027	219/553	Feb. 17, 1976
B 513,134	150/52R	Mar. 23, 1976
B 513,280	202/227	Jan. 20, 1976
B 513,346	416/157B	Mar. 9, 1976
B 513,368	307/205	Feb. 3, 1976
B 513,706	313/60	Jan. 13, 1976
B 513,756	179/1A	Feb. 3, 1976
B 513,781	260/561R	Feb. 24, 1976
B 513,789	403/107	Feb. 3, 1976
B 513,791	73/154	Mar. 30, 1976
B 514,259	260/248AS	Mar. 23, 1976
B 514,687	137/596.12	Jan. 27, 1976
B 514,839	195/1.8	Mar. 2, 1976
B 515,135	354/46	Feb. 17, 1976
B 515,216	277/81P	Feb. 17, 1976
B 515,303	222/325	Jan. 20, 1976
B 515,368	156/446	Apr. 6, 1976
B 515,452	335/253	Feb. 10, 1976
B 515,455	313/366	Jan. 27, 1976
B 515,642	260/295.5A	Feb. 24, 1976
B 515,908	250/210	Jan. 20, 1976
B 516,002	315/388	Jan. 13, 1976
B 516,032	220/288	Jan. 27, 1976
B 516,047	260/243C	Feb. 10, 1976
B 516,060	357/23	Feb. 17, 1976
B 516,069	360/49	Mar. 16, 1976
B 516,296	260/243C	Feb. 3, 1976
B 516,537	72/391	Feb. 17, 1976
B 516,564	315/408	Feb. 17, 1976
B 516,609	270/62	Feb. 24, 1976
B 516,625	208/33	Mar. 30, 1976
B 516,804	424/321	Mar. 23, 1976
B 516,825	58/21.13	Feb. 3, 1976
B 517,273	D23/142	Mar. 16, 1976
B 517,504	356/103	Mar. 9, 1976
B 517,668	23/288S	Apr. 6, 1976
B 517,762	313/94	Mar. 16, 1976
B 517,858	65/49	Feb. 17, 1976
B 517,956	D23/71	Apr. 6, 1976
B 517,957	D23/71	Apr. 6, 1976
B 518,076	260/453PH	Mar. 30, 1976
B 518,226	148/1.5	Feb. 10, 1976
B 518,326	260/606.5P	Mar. 23, 1976
B 518,656	260/438.1	Feb. 17, 1976
B 518,859	313/99	Feb. 3, 1976
B 518,999	74/546	Feb. 3, 1976
B 519,095	260/42.18	Feb. 24, 1976
B 519,355	260/17.2	Apr. 13, 1976
B 519,377	427/389	Jan. 27, 1976
B 519,446	260/637R	Feb. 24, 1976
B 519,485	260/859R	Feb. 10, 1976
B 519,486	260/873	Feb. 17, 1976
B 519,487	260/17R	Feb. 17, 1976
B 519,599	17/23	Feb. 17, 1976
B 519,623	277/27	Apr. 6, 1976
B 519,680	29/183.5	Mar. 30, 1976
B 519,932	307/293	Feb. 3, 1976
B 519,979	178/7.1	Feb. 3, 1976
B 520,063	235/151.1	Mar. 2, 1976
B 520,075	235/151.1	Feb. 24, 1976
B 520,076	235/151.1	Mar. 2, 1976
B 520,082	235/151.1	Mar. 23, 1976
B 520,115	357/52	Mar. 23, 1976
B 520,227	178/6	Mar. 30, 1976
B 520,256	260/239D	Jan. 13, 1976
B 520,277	128/260	Feb. 17, 1976
B 520,341	280/150AB	Mar. 16, 1976
B 520,384	196/14.52	Jan. 27, 1976
B 520,514	260/112.5R	Mar. 9, 1976
B 520,534	239/652	Feb. 17, 1976
B 520,543	350/310	Jan. 27, 1976
B 520,546	252/156	Mar. 2, 1976
B 520,613	315/169TV	Mar. 16, 1976
B 520,658	260/33.6AQ	Mar. 9, 1976
B 520,878	260/37PC	Apr. 6, 1976
B 520,884	313/330	Mar. 16, 1976
B 520,924	235/181	Jan. 27, 1976
B 520,928	29/428	Jan. 13, 1976
B 520,952	248/205R	Mar. 16, 1976
B 520,995	8/94.24	Mar. 23, 1976
B 521,025	260/309.6	Mar. 23, 1976
B 521,044	310/259	Feb. 24, 1976
B 521,045	310/254	Feb. 24, 1976
B 521,046	310/254	Feb. 24, 1976
B 521,125	260/75N	Feb. 10, 1976
B 521,126	260/75N	Feb. 10, 1976
B 521,127	260/75N	Feb. 17, 1976
B 521,128	260/75N	Feb. 10, 1976
B 521,324	260/348.5L	Jan. 27, 1976
B 521,480	222/67	Jan. 13, 1976
B 521,600	242/43R	Jan. 27, 1976

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B 521,612	423/471	Mar. 9, 1976
B 521,620	73/147	Jan. 27, 1976
B 521,643	260/340.9	Mar. 2, 1976
B 521,711	424/270	Feb. 10, 1976
B 521,793	144/34R	Feb. 24, 1976
B 521,984	423/283	Feb. 17, 1976
B 521,985	260/449M	Mar. 23, 1976
B 521,986	408/146	Feb. 3, 1976
B 522,009	62/306	Feb. 17, 1976
B 522,038	164/330	Feb. 3, 1976
B 522,080	192/46	Mar. 16, 1976
B 522,227	66/190	Mar. 30, 1976
B 522,309	73/67.5H	Feb. 3, 1976
B 522,354	52/484	Jan. 20, 1976
B 522,446	260/80M	Mar. 30, 1976
B 522,537	152/379S	Mar. 30, 1976
B 522,567	260/309.2	Feb. 17, 1976
B 522,568	D12/147	Apr. 6, 1976
B 522,577	250/227	Jan. 27, 1976
B 522,629	260/29.2EP	Mar. 16, 1976
B 523,080	73/557	Feb. 17, 1976
B 523,129	256/65	Apr. 13, 1976
B 523,226	307/252B	Mar. 23, 1976
B 523,696	313/404	Jan. 13, 1976
B 523,885	15/229A	Feb. 17, 1976
B 523,952	336/65	Mar. 23, 1976
B 524,026	96/35	Feb. 10, 1976
B 524,121	128/260	Feb. 3, 1976
B 524,179	424/122	Jan. 13, 1976
B 524,464	136/148	Feb. 10, 1976
B 524,806	210/23H	Mar. 2, 1976
B 524,849	260/598	Mar. 23, 1976
B 525,133	307/262	Mar. 23, 1976
B 525,204	210/22R	Mar. 16, 1976
B 525,809	74/482	Feb. 24, 1976
B 525,961	75/135	Jan. 13, 1976
B 526,027	260/683.48	Feb. 17, 1976
B 526,096	260/243C	Feb. 3, 1976
B 526,106	340/347AD	Jan. 27, 1976
B 526,190	250/364	Feb. 17, 1976
B 526,279	180/79.2R	Apr. 13, 1976
B 526,289	310/168	Feb. 24, 1976
B 526,388	274/37	Feb. 3, 1976
B 526,445	60/422	Jan. 20, 1976
B 526,447	204/163R	Feb. 24, 1976
B 526,510	260/294.8D	Jan. 20, 1976
B 526,654	335/186	Mar. 23, 1976
B 526,942	260/449R	Mar. 30, 1976
B 526,997	260/29.2EP	Jan. 13, 1976
B 527,040	195/80R	Mar. 23, 1976
B 527,054	350/160LC	Feb. 17, 1976
B 527,171	139/122R	Mar. 9, 1976
B 527,187	317/124	Feb. 17, 1976
B 527,333	248/309R	Mar. 23, 1976
B 527,669	331/94.5T	Jan. 13, 1976
B 527,693	331/116R	Feb. 3, 1976
B 527,788	D12/60	Feb. 10, 1976
B 527,972	148/23	Mar. 9, 1976
B 527,999	21/2.7R	Feb. 3, 1976
B 528,297	252/301.2W	Mar. 16, 1976
B 528,303	260/18TN	Feb. 10, 1976
B 528,401	73/437	Feb. 3, 1976
B 528,756	137/625.46	Feb. 3, 1976
B 528,761	338/202	Feb. 10, 1976
B 528,962	260/46.5UA	Feb. 24, 1976
B 528,966	260/46.5UA	Feb. 24, 1976
B 529,156	220/23.83	Jan. 13, 1976
B 529,194	165/32	Mar. 23, 1976
B 529,214	101/1	Apr. 20, 1976
B 529,659	114/144R	Feb. 24, 1976
B 529,836	166/303	Feb. 3, 1976
B 529,925	340/171R	Mar. 30, 1976
B 529,974	260/568	Feb. 17, 1976
B 530,174	260/93.5A	Feb. 24, 1976
B 530,255	195/1.8	Mar. 2, 1976
B 530,263	138/177	Mar. 30, 1976
B 530,285	307/300	Apr. 6, 1976
B 530,303	252/106	Mar. 23, 1976
B 530,318	260/285.5	Jan. 13, 1976
B 530,437	260/67.6R	Apr. 13, 1976
B 530,569	356/239	Mar. 16, 1976
B 530,580	260/17.4ST	Mar. 2, 1976
B 530,605	137/614.11	Feb. 3, 1976
B 530,709	73/40.5R	Apr. 6, 1976
B 530,813	330/15	Feb. 17, 1976
B 530,873	96/35.1	Feb. 17, 1976
B 530,925	260/465.9	Feb. 24, 1976
B 531,096	260/256.5R	Feb. 10, 1976
B 531,267	192/4A	Feb. 24, 1976
B 531,425	200/11TC	Feb. 3, 1976
B 531,566	317/120	Mar. 16, 1976
B 531,686	330/17	Mar. 23, 1976
B 531,753	37/57	Mar. 2, 1976
B 531,929	313/273	Jan. 20, 1976
B 532,005	260/308D	Feb. 24, 1976
B 532,140	260/473S	Mar. 2, 1976
B 532,319	73/37.7	Feb. 3, 1976
B 532,326	328/167	Mar. 23, 1976
B 532,424	D83/1C	Feb. 10, 1976
B 532,476	24/75	Feb. 3, 1976
B 532,477	260/309.7	Apr. 13, 1976
B 532,679	114/235B	Apr. 6, 1976
B 532,901	210/130	Jan. 13, 1976
B 532,969	65/3A	Jan. 13, 1976
B 532,976	222/512	Mar. 23, 1976
B 533,056	188/73.6	Jan. 13, 1976
B 533,259	128/419PG	Feb. 24, 1976
B 533,454	340/172.5	Mar. 2, 1976
B 533,580	354/70	Feb. 3, 1976
B 533,652	260/565	Mar. 23, 1976
B 533,734	321/2	Jan. 27, 1976
B 533,968	180/79.2R	Jan. 27, 1976
B 534,016	235/154	Feb. 3, 1976
B 534,313	431/175	Jan. 27, 1976
B 534,314	204/224M	Feb. 10, 1976
B 534,333	251/129	Feb. 17, 1976
B 534,334	D26/5C	Mar. 16, 1976
B 534,443	313/42	Jan. 27, 1976
B 534,574	128/2.06R	Feb. 24, 1976
B 534,591	260/948	Feb. 17, 1976
B 534,680	260/346.2R	Apr. 20, 1976
B 534,767	324/51	Feb. 3, 1976
B 534,915	317/18D	Mar. 23, 1976
B 534,991	333/72	Jan. 27, 1976
B 535,076	71/113	Jan. 20, 1976
B 535,209	357/59	Mar. 16, 1976
B 535,256	333/10	Mar. 23, 1976
B 535,268	235/151.1	Mar. 30, 1976
B 535,386	60/425	Jan. 13, 1976
B 535,391	197/18	Jan. 27, 1976
B 535,411	188/71.1	Feb. 24, 1976
B 535,437	260/310R	Feb. 24, 1976
B 535,448	242/56R	Mar. 16, 1976
B 535,466	128/419P	Jan. 27, 1976
B 535,813	252/301.4S	Jan. 27, 1976
B 535,928	244/134R	Jan. 13, 1976
B 535,944	426/276	Jan. 13, 1976
B 536,009	235/156	Jan. 27, 1976
B 536,082	250/303	Mar. 16, 1976
B 536,322	260/326HL	Mar. 23, 1976
B 536,403	214/90R	Mar. 23, 1976
B 536,511	432/49	Mar. 9, 1976
B 536,675	260/343.3	Jan. 20, 1976
B 536,923	206/1.5	Mar. 30, 1976
B 536,935	260/239D	Jan. 13, 1976
B 537,053	260/290HL	Mar. 23, 1976
B 537,058	8/173	Mar. 23, 1976
B 537,085	427/186	Feb. 17, 1976
B 537,102	260/2.5AC	Jan. 13, 1976
B 537,709	173/104	Jan. 13, 1976
B 537,711	260/248NS	Jan. 13, 1976
B 537,722	350/96WG	Feb. 3, 1976
B 537,903	126/350A	Jan. 20, 1976
B 537,990	229/2.5	Jan. 13, 1976
B 538,472	60/645	Feb. 3, 1976
B 538,491	75/84.1R	Feb. 17, 1976
B 538,686	331/51	Jan. 13, 1976
B 538,753	260/239.1	Feb. 10, 1976
B 539,374	260/268TR	Mar. 9, 1976
B 539,746	310/4R	Feb. 17, 1976
B 540,078	307/232	Jan. 13, 1976
B 540,218	324/60C	Feb. 10, 1976
B 540,632	403/318	Jan. 13, 1976
B 540,703	227/83	Apr. 13, 1976
B 540,767	235/151.11	Mar. 16, 1976
B 540,872	307/88.3	Jan. 20, 1976
B 540,888	33/143F	Mar. 30, 1976
B 541,015	215/216	Jan. 27, 1976
B 541,376	48/73	Feb. 17, 1976
B 541,415	179/170D	Feb. 3, 1976
B 541,464	60/349	Feb. 17, 1976
B 541,496	340/172.5	Jan. 27, 1976
B 541,501	239/533	Apr. 13, 1976
B 541,517	335/210	Jan. 13, 1976
B 541,710	251/1B	Feb. 24, 1976
B 542,135	204/15	Feb. 10, 1976
B 542,158	260/309.2	Jan. 13, 1976
B 542,226	424/118	Feb. 24, 1976
B 542,258	204/252	Mar. 23, 1976
B 543,078	165/13	Feb. 17, 1976
B 543,941	55/352	Jan. 13, 1976
B 544,034	277/27	Feb. 17, 1976
B 544,476	252/408R	Feb. 24, 1976
B 544,899	260/501.12	Feb. 17, 1976

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B 544,961	325/468	Jan. 13, 1976
B 545,050	179/7.1R	Jan. 20, 1976
B 545,265	D26/1B	Apr. 13, 1976
B 545,299	260/295.5A	Feb. 24, 1976
B 545,344	346/35	Mar. 30, 1976
B 545,464	260/293.54	Feb. 10, 1976
B 545,630	144/241	Jan. 27, 1976
B 545,777	65/239	Jan. 27, 1976
B 545,856	303/71	Mar. 30, 1976
B 545,935	83/425	Jan. 27, 1976
B 545,945	340/173R	Jan. 27, 1976
B 546,097	35/17	Mar. 23, 1976
B 546,149	260/79.5P	Mar. 2, 1976
B 546,295	260/348.6	Jan. 20, 1976
B 546,426	178/6	Jan. 27, 1976
B 546,631	72/43	Feb. 3, 1976
B 546,665	340/198	Jan. 20, 1976
B 546,677	164/4	Apr. 6, 1976
B 546,911	29/96	Jan. 13, 1976
B 546,922	114/16.6	Mar. 16, 1976
B 547,016	259/8	Mar. 23, 1976
B 547,208	260/239.1	Feb. 24, 1976
B 547,547	424/274	Feb. 24, 1976
B 547,994	343/786	Jan. 20, 1976
B 548,028	47/57.6	Feb. 3, 1976
B 548,058	252/301.1W	Feb. 17, 1976
B 548,155	249/135	Jan. 13, 1976
B 548,302	307/251	Feb. 17, 1976
B 548,440	350/320	Feb. 3, 1976
B 548,462	D57/1F	Feb. 10, 1976
B 548,688	425/521	Mar. 9, 1976
B 548,719	192/3.57	Feb. 17, 1976
B 548,978	93/58.3	Mar. 9, 1976
B 549,198	423/390	Jan. 13, 1976
B 549,244	56/14.5	Jan. 27, 1976
B 549,394	416/61	Jan. 27, 1976
B 549,931	331/94.5C	Jan. 20, 1976
B 549,964	292/254	Feb. 24, 1976
B 550,693	328/155	Jan. 20, 1976
B 550,744	204/158HA	Feb. 17, 1976
B 550,810	280/124F	Mar. 23, 1976
B 551,133	60/299	Mar. 2, 1976
B 551,463	260/448.2N	Feb. 17, 1976
B 551,527	180/53R	Jan. 13, 1976
B 551,809	60/431	Feb. 24, 1976
B 551,952	28/77	Mar. 2, 1976
B 552,006	415/214	Feb. 3, 1976
B 552,489	260/75N	Feb. 10, 1976
B 552,498	260/330.5	Jan. 13, 1976
B 552,508	260/293.52	Mar. 16, 1976
B 552,629	162/198	Mar. 23, 1976
B 552,709	427/123	Mar. 23, 1976
B 552,932	293/71P	Feb. 3, 1976
B 553,421	252/514	Mar. 23, 1976
B 553,460	330/207P	Feb. 3, 1976
B 553,584	260/632R	Feb. 17, 1976
B 553,629	15/302	Feb. 24, 1976
B 554,039	23/230B	Feb. 24, 1976
B 554,164	148/187	Mar. 9, 1976
B 554,283	61/.5	Jan. 27, 1976
B 554,291	260/210AB	Mar. 9, 1976
B 554,380	260/2.5B	Mar. 9, 1976
B 554,594	179/1G	Jan. 20, 1976
B 554,655	428/428	Feb. 24, 1976
B 554,848	260/307H	Feb. 24, 1976
B 554,939	358/8	Feb. 10, 1976
B 555,146	73/290R	Apr. 20, 1976
B 555,437	264/161	Feb. 3, 1976
B 555,456	425/339	Mar. 30, 1976
B 555,772	214/58	Jan. 13, 1976
B 556,057	259/191	Jan. 13, 1976
B 556,496	60/660	Mar. 16, 1976
B 556,897	84/1.16	Feb. 3, 1976
B 557,153	73/29	Feb. 3, 1976
B 557,274	179/111E	Mar. 23, 1976
B 557,299	99/355	Feb. 3, 1976
B 557,621	401/219	Feb. 3, 1976
B 557,721	65/11W	Mar. 23, 1976
B 557,856	260/2.5AJ	Feb. 10, 1976
B 558,220	325/40	Jan. 27, 1976
B 558,251	123/182	Jan. 13, 1976
B 558,813	236/15A	Feb. 3, 1976
B 558,818	74/243C	Jan. 13, 1976
B 558,819	37/8	Feb. 3, 1976
B 558,973	56/15.9	Feb. 10, 1976
B 559,111	354/288	Feb. 24, 1976
B 559,142	252/12	Mar. 2, 1976
B 559,394	252/299	Apr. 20, 1976
B 559,441	260/33.6UA	Mar. 23, 1976
B 559,631	178/70R	Mar. 23, 1976
B 559,697	222/56	Mar. 16, 1976
B 559,700	260/75N	Mar. 23, 1976
B 559,701	260/75N	Mar. 23, 1976
B 559,737	235/152	Jan. 20, 1976
B 559,954	222/306	Feb. 3, 1976
B 560,261	346/139C	Mar. 16, 1976
B 560,488	235/175	Mar. 16, 1976
B 560,717	426/535	Feb. 10, 1976
B 560,765	250/227	Feb. 3, 1976
B 561,062	D19/62	Feb. 10, 1976
B 561,165	100/35	Mar. 30, 1976
B 561,166	100/48	Mar. 30, 1976
B 561,365	260/239.5	Apr. 13, 1976
B 561,387	260/45.7SW	Feb. 10, 1976
B 561,405	148/174	Mar. 30, 1976
B 561,712	415/115	Feb. 17, 1976
B 561,732	29/578	Feb. 3, 1976
B 561,764	178/88	Jan. 27, 1976
B 561,770	178/7.3DC	Mar. 16, 1976
B 561,784	310/41	Jan. 27, 1976
B 562,413	308/36.3	Mar. 16, 1976
B 562,462	261/39A	Jan. 13, 1976
B 562,519	166/273	Mar. 30, 1976
B 562,601	222/181	Mar. 16, 1976
B 562,698	188/218XL	Jan. 13, 1976
B 562,813	425/384	Feb. 3, 1976
B 563,070	260/268TR	Mar. 9, 1976
B 563,165	23/273V	Mar. 9, 1976
B 563,244	343/815	Jan. 27, 1976
B 563,301	118/637	Feb. 17, 1976
B 563,412	415/136	Feb. 24, 1976
B 563,419	235/153AK	Mar. 23, 1976
B 563,722	156/3	Jan. 13, 1976
B 563,780	123/75B	Feb. 3, 1976
B 563,932	72/238	Mar. 23, 1976
B 564,252	260/465.7	Mar. 2, 1976
B564,255	106/288	Mar. 30, 1976
B 564,314	62/353	Jan. 20, 1976
B 564,902	260/900	Mar. 23, 1976
B 565,180	23/288F	Jan. 27, 1976
B 565,275	73/199	Apr. 6, 1976
B 565,717	329/2	Apr. 13, 1976
B 565,754	16/129	Mar. 30, 1976
B 566,464	424/273	Feb. 3, 1976
B 566,556	339/5M	Mar. 23, 1976
B 566,572	250/564	Mar. 16, 1976
B 566,585	195/65	Mar. 2, 1976
B 567,058	173/170	Jan. 13, 1976
B 567,076	260/29.6F	Mar. 23, 1976
B 567,158	416/145	Mar. 23, 1976
B 567,207	110/8P	Apr. 13, 1976
B 567,435	188/165	Feb. 3, 1976
B 567,854	74/242.1A	Feb. 3, 1976
B 567,892	239/265.39	Mar. 16, 1976
B 568,226	340/167B	Feb. 24, 1976
B 568,405	260/307G	Mar. 30, 1976
B 568,770	333/31A	Feb. 10, 1976
B 569,125	252/404	Feb. 24, 1976
B 569,293	250/397	Mar. 30, 1976
B 569,501	19/155	Mar. 9, 1976
B 569,519	166/272	Feb. 3, 1976
B 569,646	198/129	Jan. 13, 1976
B 569,859	73/116	Mar. 9, 1976
B 570,172	123/8.45	Feb. 3, 1976
B 570,382	239/288.3	Apr. 13, 1976
B 570,615	417/274	Mar. 23, 1976
B 570,721	260/33.8UA	Mar. 23, 1976
B 570,862	83/61	Feb. 24, 1976
B 570,925	55/71	Mar. 23, 1976
B 571,219	331/117R	Feb. 24, 1976
B 571,638	260/287D	Mar. 9, 1976
B 571,659	313/231.4	Apr. 13, 1976
B 572,642	280/236	Feb. 10, 1976
B 572,726	426/239	Feb. 24, 1976
B 573,033	328/168	Mar. 23, 1976
B 573,114	260/29.7T	Apr. 6, 1976
B 573,991	260/465H	Mar. 30, 1976
B 573,994	73/9	Mar. 23, 1976
B 574,128	136/86R	Feb. 17, 1976
B 574,616	250/445T	Mar. 2, 1976
B 574,996	260/330.5	Feb. 17, 1976
B 575,583	303/21BE	Mar. 16, 1976
B 575,757	72/88	Jan. 27, 1976
B 575,761	166/250	Apr. 13, 1976
B 575,776	166/250	Apr. 20, 1976
B 575,851	260/876B	Feb. 10, 1976
B 576,385	11/1AD	Mar. 30, 1976
B 576,859	51/358	Feb. 24, 1976
B 576,903	424/203	Feb. 3, 1976
B 578,447	220/337	Jan. 20, 1976
B 579,104	200/5R	Jan. 27, 1976
B 579,116	15/256.53	Feb. 3, 1976
B 579,153	264/37	Mar. 30, 1976
B 579,806	360/130	Feb. 3, 1976

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B 580,379	193/35A	Apr. 6, 1976
B 580,826	260/876R	Feb. 17, 1976
B 580,921	239/424	Jan. 13, 1976
B 581,564	106/47R	Mar. 23, 1976
B 581,843	30/133	Mar. 16, 1976
B 583,051	280/150.5	Feb. 3, 1976
B 583,089	323/17	Jan. 27, 1976
B 583,712	426/3	Feb. 10, 1976
B 584,520	60/424	Jan. 27, 1976
B 584,997	156/608	Mar. 9, 1976
B 585,247	200/67D	Feb. 3, 1976
B 585,731	252/518	Feb. 3, 1976
B 586,215	239/424	Jan. 20, 1976
B 586,380	131/514.4	Mar. 2, 1976
B 586,387	131/144	Feb. 3, 1976
B 586,663	350/103	Feb. 3, 1976
B 587,118	178/7.1	Mar. 2, 1976
B 587,786	424/281	Feb. 17, 1976
B 587,936	235/153AM	Mar. 23, 1976
B 589,179	204/186	Mar. 23, 1976
B 589,687	16/125	Mar. 23, 1976
B 589,966	260/876R	Feb. 17, 1976
B 590,158	140/92.1	Feb. 10, 1976
B 590,159	140/92.1	Feb. 3, 1976
B 590,502	260/40R	Mar. 23, 1976
B 591,141	260/157	Mar. 23, 1976
B 591,615	52/225	Mar. 30, 1976
B 592,143	310/155	Jan. 27, 1976
B 592,146	195/65	Mar. 2, 1976
B 592,658	260/31.8N	Mar. 23, 1976
B 593,781	48/192	Mar. 16, 1976
B 594,871	16/128R	Mar. 16, 1976
B 596,692	260/32.6R	Feb. 17, 1976
B 597,410	297/304	Mar. 30, 1976
B 632,416	260/88.2F	Mar. 9, 1976
B 657,438	260/33.6AQ	Jan. 20, 1976
B 747,785	260/465.5R	Feb. 10, 1976
B 750,679	106/58	Mar. 23, 1976
B 843,038	204/195S	Feb. 3, 1976
B 845,044	260/610A	Mar. 30, 1976
B 848,336	424/129	Mar. 30, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF APRIL, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See—*
Evalahti, Osmo Rainer, 3,953,284.

A. B. Chance Company: *See—*
Martin, Vance B.; Allen, George D.; Haubein, Harold D.; Goe, Melvin B., Jr.; and Toeniskoetter, Kenneth A., 3,953,818.

A. L. Hansen Mfg. Co.: *See—*
Hansen, Randall C.; and Miller, Kenneth J., 3,953,061.

A. O. Smith Corporation: *See—*
Wasson, Loerwood C., 3,953,311.

A & W Deep-Well Drilling, Inc.: *See—*
Adcock, Gerald L., 3,952,819.

AB Bofors: *See—*
Eriksson, Nils Borje; and Tidemalm, Gustav Hilmer, 3,952,632.

AB Cale Industri: *See—*
Andersson, Carl-Axel; and Farkas, Bela, 3,952,850.

AB Centralsug: *See—*
Aitken, Ian Miller Edington, 3,953,078.

AB Kabi: *See—*
Uthne, Knut Oivind; and Aberg, Gustaf Bertil, 3,953,290.

ABC Packaging Machine Corporation: *See—*
Reichert, Donald G., 3,952,636.

Abe, Kiyomi: *See—*
Tanaka, Koich; Tagata, Genichi; and Abe, Kiyomi, 3,952,425.

Abe, Miwako: *See—*
Mizutani, Hiroshi; Abe, Miwako; and Nakasone, Yumio, 3,953,352.

Abe, Zenmon: *See—*
Furuhata, Yoshio; Kato, Yasuo; and Abe, Zenmon, 3,953,503.

Aberg, Gustaf Bertil: *See—*
Uthne, Knut Oivind; and Aberg, Gustaf Bertil, 3,953,290.

Abramson, Newton L.: *See—*
Czaja, Robert F.; Pines, Seemon H.; and Abramson, Newton L., 3,953,520.

Achelpohl, Fritz, to Windmoller & Holscher. Machine for sliding valved sacks onto the filling nipple of a filling machine. 3,952,479, Cl. 53-187.000.

Acker, Arnold E. Flag holder. 3,952,981, Cl. 248-291.000.

Adams, James D. Small component sawing assembly. 3,952,620, Cl. 83-422.000.

Adams, Sally Lee: *See—*
Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 3,952,805.

Adcock, Gerald L., to A & W Deep-Well Drilling, Inc. Fatigue resistant anvil bit for percussion rock drill. 3,952,819, Cl. 175-293.000.

Addison, Frank F.; and Montgomery, James B. Canopy. 3,952,758, Cl. 135-5.0AT.

Addiss, Richard Robert, Jr.; and Albertinetti, Nedo Peter, to Itek Corporation. Process for coating glass onto polymeric substrates. 3,953,652, Cl. 428-412.000.

Addressograph Multigraph Corporation: *See—*
Jesensky, Alexander; Fedesna, Kenneth J.; and De Ryke, Thomas V., 3,953,123.
Kolibas, James A., 3,953,124.
Zimmer, Robert E., 3,953,772.

Advanced Mineral Research: *See—*
Kihlstedt, Per Gudmar; and Forssberg, Knut Sven Eric, 3,953,563.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Gabillard, Robert, 3,953,714.
Monpetit, Louis, 3,953,716.

Agency of Industrial Science & Technology: *See—*
Matsubara, Kiyoshi, 3,953,619.

Aggregates Equipment, Inc.: *See—*
McCorkel, Franklin M., 3,952,862.

Aglitsky, Vladimir Efimovich: *See—*
Kovanov, Pavel Vasilievich; Alexandrov, Adolf Moritsovich; Tsimbler, Jury Abramovich; and Aglitsky, Vladimir Efimovich, 3,952,667.

Agran, Jack: *See—*
Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, 3,953,614.

Ahlquist, Norman C.; Waggoner, Alan P.; and Charlson, Robert J., to Battelle Development Corporation. Photon-counting integrating nephelometer. 3,953,127, Cl. 356-103.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Ground fault detection apparatus. 3,953,767, Cl. 317-18.00D.

Aiba, Masahiko: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 3,953,860.

Aihara, Masayuki: *See—*
Ohata, Yoichi; and Aihara, Masayuki, 3,953,443.

Aikoh Co., Ltd.: *See—*
Takashima, Masaru, 3,953,219.

AIRCO, Inc.: *See—*
Cibulka, Anthony B., 3,952,739.

Aitken, Ian Miller Edington, to AB Centralsug. System of pneumatic transport of domestic refuse and the like. 3,953,078, Cl. 302-27.000.

Aizawa, Hiroshi: *See—*
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,953,729.

Akamatsu, Toshiaki; Yasugi, Masahiko; and Bito, Mitsuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Master gear for checking tooth contact. 3,952,418, Cl. 33-174.00L.

Akeel, A. Hadi K.: *See—*
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Akzona Incorporated: *See—*
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Albee, Thomas K., to Bunker Ramo Corporation, The. Broadband VLF loop antenna system. 3,953,799, Cl. 325-376.000.

Albertinetti, Nedo Peter: *See—*
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Albertsen, Anders, to Lawrence Peska Associates, Inc., a part interest. Container loading device. 3,952,481, Cl. 53-392.000.

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Aldag, Wilhelm. Separation of sludge. 3,953,328, Cl. 210-7.000.

Aldinger, Karl E., to Kimberly-Clark Corporation. Tape attachment system for disposable diapers. 3,952,744, Cl. 128-287.000.

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Amberntsson, Jan Roger; Andersson, Roger Ingemar; and Sultan, Stig Bertil, to Facit Aktiebolag. Printing head device for an ink jet printer. 3,953,862, Cl. 346-140.00R.

Amburgey, Ossie. Safety barrier. 3,952,453, Cl. 49-34.000.

American Can Company: *See—*
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Anderson, Edward P.; and Harris, Mark, to Brunswick Corporation. Cathodic protection monitoring apparatus for marine propulsion device. 3,953,742, Cl. 307-95.000.
Anderson, George E., to United States of America, Navy. Al-AgO primary battery. 3,953,239, Cl. 136-100.00R.
Anderson, John Forrest, to Longyear Company. Basket type core retainer. 3,952,817, Cl. 175-240.000.
Anderson, Paul L., to Sandoz, Inc. α-Substituted-4-(2,2-dimethyl-1-hydroxypropyl)benzyl alcohols and esters. 3,953,525, Cl. 260-618.00R.
Anderson, Richard J.; and Henrick, Clive A., to Zoecon Corporation. 4,8-Tridecadien-1-ol,4 cis,8 cis,trans. 3,953,532, Cl. 260-632.00R.
Anderson, Thomas E.; and Walden, John P., to General Electric Company. Inverter having forced turn-off. 3,953,780, Cl. 321-18.000.
Anderson, Wallace E.; Krall, Albert D.; Syeles, Albert M.; and Van Sant, Oscar J., to United States of America, Navy. Wide bandwidth phase scanning with simple controls. 3,953,852, Cl. 343-100.0SA.
Andersson, Carl-Axel; and Farkas, Bela, to AB Cale Industri. Automatic ticket machine. 3,952,850, Cl. 194-1.00N.
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Aoki, Tadashi; and Komiya, Yasuo, to Kabushiki Kaisha Saginomiya Seisakusho. Reversing valve means for use with a reversible refrigerating cycle system. 3,952,537, Cl. 62-324.000.
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Arenhold, Knut. Mud flaps for automobile fenders. 3,953,053, Cl. 280-154.50R.
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Aviram, Arieh; Freiser, Marvin Joseph; Seiden, Philip Edward; and Young, William Robert, to International Business Machines Corporation. Organic electronic rectifying devices. 3,953,874, Cl. 357-8.000.

Ayers, Orval E.; Dykes, Hiram W. H.; and Alley, Bernard J., to United States of America, Army. Method for preparing small particle size coated ammonium perchlorate. 3,953,257, Cl. 149-7.000.

Ayres, Waldemar A. Fractional-fill capillary pipette and method. 3,952,599, Cl. 73-425.40P.

Babb, Burton A., to Babbco, Ltd. Audio speaker system. 3,953,675, Cl. 179-1.00E.

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Baechtold, Werner; and Gueret, Pierre L., to International Business Machines Corporation. Binary circuitry including switching elements utilizing superconductive tunneling effects. 3,953,749, Cl. 307-277.000.

Bailey, Walter H., to Texas Instruments Incorporated. Charge transfer device signal processing system. 3,953,745, Cl. 307-221.00C.

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Bainton, John W., to Tekology Corporation. Addition of acidulated pozzolan to concrete and concrete products. 3,953,222, Cl. 106-97.000.

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Baker, Don R., to Stauffer Chemical Company. Tetrahydrofuranyl bromoacetates biocides. 3,953,478, Cl. 260-347.400.

Baker, Don R.; and Walker, Francis H., to Stauffer Chemical Company. N-t-butyl-α-(3,5-substituted phenoxy) alkyl amides and their use as herbicides. 3,953,507, Cl. 260-559.00B.

Baker, Joseph E., to Olin Corporation. Metal anode assembly. 3,953,316, Cl. 204-288.000.

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Bako, Lazlo, to Presto Lock Company. Combination lock in a luggage case handle stud. 3,952,561, Cl. 70-70.000.

Baldocchi, Archie. Belt attachment device for holster or the like. 3,952,930, Cl. 224-2.00C.

Bally Berard, Yves; Claudin, Paul; and Leymarie, Claude, to Merlin Gerin. Electronic equipment assembly comprising plug-in modules and test bars. 3,953,797, Cl. 324-158.00F.

Balut, Jacques Albert Louis Georges; Lemaire, Pierre Eugene Gerard K.; and Loisy, Claude Michel, to Etat Francais. Nuclear-burst strength detecting and measuring device. 3,953,137, Cl. 356-222.000.

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Barbe, Guy, to Etudes et Fabrications Aeronautiques. Buckle for retarded automatic unlocking of safety belts and harnesses of parachuting equipments and of vehicles. 3,952,381, Cl. 24-230.00A.

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Bardebes, David Paul. Inflatable buoyancy aids. 3,952,355, Cl. 9-316.000.

Barile, Mario; Canavesi, Francesco; and Franchini, Pier Vincenzo, to Fiat Societa per Azioni. Energy dissipator for motor vehicle safety belts. 3,952,967, Cl. 242-107.40R.

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Barrett, Edward L. Three phase alternators. 3,953,753, Cl. 310-168.000.

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Baur, Edmund; Holdt, Bernd-Dieter; Ratering, Hans Werner; Thesing, Georg; and Turk, Erich, to Henkel & Cie G.m.b.H. Automatic toilet cleaning device. 3,952,339, Cl. 4-228.000.

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Clark, Charles W.; Morton, Edwin G.; and Voss, Robert L., 3,953,808.
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Gannett, Danforth K., 3,953,678.
Judice, Charles Norris, 3,953,668.
Ngo, Peter Dinh-Tuan, 3,953,886.
Ninke, William Herbert, 3,953,672.
Ohm, Edward Allen, 3,953,858.

Bell, William Sherman, Jr., to Telxon Corporation. Power supply. 3,953,785, Cl. 321-43.000.

Beltran, Adrian M.: *See—*
Schilling, William F.; Beltran, Adrian M.; and Wasielewski, Gerald E., 3,952,939.

Belzecki, Czeslaw; Tomasik, Witold; and Trojnar, Jerzy, to Polska Akademia Nauk Instytut Chemii Organicznej. Process for manufacturing 2-aminobutanol. 3,953,512, Cl. 260-584.00R.

Bend Research Inc.: *See—*
Baker, Richard William, 3,952,741.

Bendix Corporation, The: *See—*
Han, Chung Ping, 3,952,846.
Latvala, Bruce E.; and Karon, Marc A., 3,953,083.
Sebo, Milan J.; and Bartholomew, Roy E., 3,953,079.
Van Siclen, Howard E., Jr., 3,952,715.

Benjamin, Gary L., to R. L. Kuss & Co., Inc. Water mattress construction. 3,952,348, Cl. 5-370.0WI.

Benjamin, Robert P.; and Peter, Harley D., to E-Systems, Inc. Digital solid state compass. 3,952,420, Cl. 33-361.000.

Bennett, Milton C., to J. I. Case Company. Apparatus for counting particle contamination in a liquid. 3,952,580, Cl. 73-61.400.

Benson, Clarence Eugene, to Carlton Company. Saw chain sharpening system. 3,952,615, Cl. 76-25.00A.

Benson, Gustav Eric Valdemar. Dispenser for dispensing a liquid or pasty product from a container. 3,952,924, Cl. 222-181.000.

Bergman, Carl, to Bridgeport Chemical Corporation. Dispenser for multi-component products. 3,952,920, Cl. 222-137.000.

Berkowitz, Irving L., to Kason Hardware Corporation. Ventilator. 3,952,542, Cl. 62-409.000.

Bernard, Georges; and Montanier, Pierre, to Merlin Gerin. Magnetic-blast arc extinguishing device having permanent magnets. 3,953,694, Cl. 200-147.00A.

Bernard, Jean-Paul; Brussieux, Pierre Jules Henry; Jumelle, Louis Francois; and Simonin, Jean Lucien, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Composite material with acoustic absorption properties. 3,952,831, Cl. 181-33.00G.

Bernhardt, Werner, to U.S. Philips Corporation. Pushbutton system, in particular for a pushbutton operated car radio receiver. 3,952,603, Cl. 74-10.330.

Beroza, Morton; Sarmiento, Rafael; and McGovern, Terrence P., to United States of America, Agriculture. Method of controlling insects using 7-ethoxy-1-(p-ethylphenoxy)-3,7-dimethyl-2-octene. 3,953,607, Cl. 424-341.000.

Berriman, Lester P.: *See—*
Eversole, James F.; and Berriman, Lester P., 3,952,776.

Berstein, Gregor, to Cabot Corporation. Paper coating compositions and organic pigments used therein. 3,953,421, Cl. 260-17.300.

Bessen, Irwin I., to General Electric Company. Coating powder mixture. 3,953,193, Cl. 75-.50R.

Bestehorn, Peter, to Messerschmitt-Bolkow-Blohm GmbH. Angle measuring device. 3,952,417, Cl. 33-75.00R.

Bethel, Everett L.: *See—*
Moore, Ronald D.; and Bethel, Everett L., 3,952,383.

Bethlehem Steel Corporation: *See—*
Strepelis, John J.; and Gensler, Wayne C., 3,953,299.

Betz Laboratories, Inc.: *See—*
Tonkyn, Richard G.; Vorchheimer, Norman; Fowler, William J., Jr.; and Heberle, Richard A., 3,953,330.

Bevco Precision Manufacturing Company: *See—*
Bevington, Kenneth A., 3,952,987.

Bevington, Kenneth A., to Bevco Precision Manufacturing Company. Chair adjustment construction. 3,952,987, Cl. 248-408.000.

Beyer, Arnold D.; Crockett, Charles R.; and Mitchell, Patrick G., to Kaiser Aluminum & Chemical Corporation. Can treating system. 3,952,698, Cl. 118-314.000.

Beyers, Marvin Edward, to Caterpillar Tractor Co. Hydraulic steering system for articulated vehicles. 3,952,825, Cl. 180-139.000.

Bezold, Karl-Heinz: *See—*
Forster, Johannes; and Bezold, Karl-Heinz, 3,953,781.

Biber, Conrad H., to Polaroid Corporation. Electronic sound motion picture projector and television receiver. 3,953,885, Cl. 358-54.000.

BICC Limited: *See—*
Walker, Wilfred Arthur; and Littler, Joseph, 3,952,848.

Bickel, Samuel H., to Texas Instruments Incorporated. Solid state microwave oven power source. 3,953,702, Cl. 219-10.55R.

Biddulph, Richard Hampton, to United States Borax & Chemical Corporation. Furnace temperature control system. 3,952,945, Cl. 236-15.00B.

Bidgood, William T. Cushion retaining means for eyeglasses. 3,953,114, Cl. 351-123.000.

Bienvenu, Jacques Michel Jean: *See—*
Rottier, Marcel Rene; and Bienvenu, Jacques Michel Jean, 3,953,717.

Bimba Manufacturing Company: *See—*
Gasper, Ralph L., 3,953,213.

Bindrum, Irmgard: *See—*
Brandt, Wilhelm; and Bindrum, Irmgard, 3,953,658.

Bio-Medical Sciences, Inc.: *See—*
Witonsky, Robert J.; and Larsson, Raymond P., 3,952,597.

Birman, Paul W., Jr.: *See—*
Holt, Ronald; and Birman, Paul W., Jr., 3,952,859.

Bito, Mitsuyuki: *See—*
Akamatsu, Toshiaki; Yasugi, Masahiko; and Bito, Mitsuyuki, 3,952,418.

Blau, Leslie: *See—*
Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, 3,953,614.

Blichenberg, Hans-Jurgen: *See—*
Muller, Dietrich; Blichenberg, Hans-Jurgen; Schmidt, Dieter; Focke, Heinz; and Liedtke, Kurt, 3,952,868.

Blinow, Igor, to Polaroid Corporation. Flat torque rate drive system. 3,952,835, Cl. 185-11.000.

Bloch, Herman S., to Universal Oil Products Company. Process for the preparation of n-alkyl-substituted hydroxypolyalkoxymethylcyclohexanes. 3,953,522, Cl. 260-611.00B.

Bloch, Herman S., to Universal Oil Products Company. Process for the preparation of n-alkyl-substituted hydroxypolyalkoxymethylcyclohexenes. 3,953,523, Cl. 260-611.00B.

Blodgett, Francis E.: *See—*
Vrataric, Frank, Jr.; Forrest, James E., Jr.; Campagnuolo, Carl J.; and Blodgett, Francis E., 3,952,661.

Blomgren, George E.; and Newman, Gerald H., to Union Carbide Corporation. Nonaqueous cell having an electrolyte containing crotonitrile. 3,953,235, Cl. 136-20.000.

Blondin, Guy Michel: *See—*
Astrauskas, Peter John; Blondin, Guy Michel; Picard, Roland; and Rigg, Carl Fredrik, 3,953,582.

Bloom, Stanley M.; Foley, James W.; and Hadzekyriakides, Nicholas S., to Polaroid Corporation. Novel photographic film assemblies. 3,953,872, Cl. 354-275.000.

Blum Gesellschaft m.b.H.: *See—*
Rock, Erich; and Mages, Bernhard, 3,952,366.

Boardman, Colin Alan: *See—*
Spurr, Ronald Frederick; Boardman, Colin Alan; and Yewen, John D., 3,953,791.

Boba, Joseph; and Conger, Robert P., to Congoleum Industries, Inc. Embossing of pile fabrics. 3,953,164, Cl. 8-115.000.

Bobard, Emile, to Bobard Jeune. Longitudinal member for the chassis of a straddle vehicle. 3,953,050, Cl. 280-760.000.

Bobard Jeune: *See—*
Bobard, Emile, 3,953,050.

Boccarossa, Jack; and Post, John S., to United States of America, Army. Small arms silencer. 3,952,629, Cl. 89-14.00D.

Bochan, John, to General Electric Company. Wobble washing machine. 3,952,557, Cl. 68-23.300.

Boden, Ogden W. Cord lock with both sharp and dull teeth. 3,953,144, Cl. 403-374.000.

Bodine, Albert G. Sonic technique for augmenting the flow of oil from oil bearing formations. 3,952,800, Cl. 166-249.000.

Boehmig, Robert L. Joint for transferring bending moments. 3,952,472, Cl. 52-648.000.

Boeing Company, The: *See—*
James, Varnell L., 3,952,973.
Lang, John M., 3,952,974.
Sindt, Melvin R., 3,953,700.
Wagner, David Lee, 3,952,401.

Boersma, Richard F., to Fiat-Allis Construction Machinery, Inc. Mechanism for moving scraper bowl ejector blade. 3,952,432, Cl. 37-126.0AE.

Bogentoft, Conny: *See—*
Folkers, Karl; Currie, Bruce L.; Chang, Jaw-Kang; Sievertsson, Hans; and Bogentoft, Conny, 3,953,416.

Bokros, Jack C.; and Horsley, Jere B., Jr., to General Atomic Company. Biocompatible carbon prosthetic devices. 3,952,334, Cl. 3-1.000.

Bolhofer, William A., to Merck & Co., Inc. 2-[α-(3-Trifluoromethylphenoxyl)-4-chlorobenzyl]oxazole and methods for preparing the same. 3,953,465, Cl. 260-307.00R.

Bolick, Fred C., Jr., to Lanier Electronic Laboratories, Inc. Multiple-channel dictate station apparatus with automatic release of selected channel. 3,953,685, Cl. 179-100.1DR.

Boliden Aktiebolag: *See—*
Nilsson, Bruno Yngve, 3,953,793.

Bolza-Schunemann, Hans Bernhard, to Koenig & Bauer Aktiengesellschaft. Sheet feeding apparatus for printing machines. 3,952,651, Cl. 101-242.000.

Bombay Textile Research Association: *See—*
Supanekar, Shashikant Dattatraya; and Daruwalla, Erach Hormasji, 3,953,307.

Bonarski, Henry. Canister reburn exhaust systems. 3,952,507, Cl. 60-278.000.

Bond, John A.: *See—*
Felter, John V.; Bond, John A.; and Rudine, Kenneth M., 3,952,638.

Bondesson, Ulf Goran; Gronowitz, Salo Schmul; Stjernstrom, Nils Erik; and Svensson, Tage Rolf Gunnar, to Aktiebolaget Astra. Dibenzothiophene derivatives as serum lipid lowering agents. 3,953,601, Cl. 424-275.000.

Boney, William G., to Universal Oil Products Company. Alkylation process startup procedure. 3,953,538, Cl. 260-683.480.

Bonisch, Horst: *See—*
Wurr, Jurgen; Henning, Kurt; and Bonisch, Horst, 3,953,087.

Bonkoske, Gerry L., to Teletype Corporation. Spot-coating apparatus. 3,952,697, Cl. 118-263.000.

Bonomo, Richard S. Auxiliary wheel mounting. 3,953,075, Cl. 301-40.00S.

Bookwrights, Inc.: *See—*
Roberts, Alvin V., 3,953,056.

Booth, Ralph: *See—*
Brownhill, Edward Joseph; Heaton, Roy; and Booth, Ralph, 3,952,849.

Bopp, Warren G., to Eaton Corporation. Control for fluid coupling. 3,952,508, Cl. 60-330.000.

Borchard, David C.; Chan, Robert E.; and Ratzel, Neil F., to United States of America, Air Force. Precision light exposure timing and shutter mechanism for a wide range of exposure durations. 3,953,871, Cl. 354-252.000.

Bordas, Barna: *See—*
Matolcsy, Gyorgy; and Bordas, Barna, 3,953,427.

Borg-Warner Corporation: *See—*
Fenton, Robert A.; and Donovan, Daniel L., 3,952,719.
Ma, Hsiao J.; and Studtmann, George H., 3,953,786.

Borman, Willem F. H., to General Electric Company. Solid state polymerization of poly(1,4-butylene terephthalate). 3,953,404, Cl. 260-75.00M.

Bornfleth, Ulrich: *See—*
Selonke, Fritz; and Bornfleth, Ulrich, 3,952,854.

Bornstein, Norman S.: *See—*
Brennan, John J.; and Bornstein, Norman S., 3,953,647.

Borshtein, Mikhail Vladimirovich: *See—*
Chepurnoi, Nikolai Prokhorovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; Tupitsyn, Sergei Konstantinovich; Nazarov, Nikolai Grigorievich; Plavskikh, Vladimir Dmitrievich; Tkach, Khaim Berkovich; Cherednikov, Evgeny Nikolaevich; Galbinshtein, Alexandr Nisovich; Borshtein, Mikhail Vladimirovich; Karavaev, Andron Trofimovich; Menzorov, Valery Anatolievich; and Makarov, Alexei Mikhailovich, 3,952,813.

Bose Corporation: *See—*
Veranth, Joseph L., 3,953,806.

Bost, Pierre; Constantini, Michel; Jouffret, Michel; and Lartigau, Guy, to Rhone-Poulenc, S.A. Hydroxylation or aromatic compounds. 3,953,527, Cl. 260-621.00G.

Bost, Warren J. Contact copying apparatus for reproducing X-ray films and the like. 3,953,125, Cl. 355-83.000.

Boswell, George T., to United States of America, Army. Apparatus for manufacturing detonators and resistors. 3,952,628, Cl. 86-1.00R.

Botnick, Irlin H. Non-freeze wall hydrant with vacuum breaker. 3,952,770, Cl. 137-360.000.

Bottoms, Harry Simister, to Lucas Aerospace Limited. Gear pumps and motors. 3,953,160, Cl. 418-190.000.

Bouillon, Claude; and Rosenbaum, Georges, to L'Oreal. Aluminum derivatives of N-oxypyridyl thiol and process for their preparation. 3,953,450, Cl. 260-270.00K.

Bouton, Thomas Chester: *See—*
Futamura, Shingo; and Bouton, Thomas Chester, 3,953,543.

Bowater Packaging Limited: *See—*
Rollins, Paul Ferdinand; and Chamberlain, Christopher John, 3,952,634.

Boyd, Charles N. Bottom leveling water ball apparatus. 3,953,029, Cl. 273-95.00A.

Boyle, Charles F., to Sparton Corporation. Partially filled fluid damped geophone. 3,953,829, Cl. 340-17.00R.

Bozek, John S.; and Peyser, Harry A., to Continental Can Company, Inc. Non-detachable and reclosable easy opening container closure structure. 3,952,911, Cl. 220-269.000.

Bozzo, Richard J.: *See—*
Wolfelsperger, Robert; and Bozzo, Richard J., 3,952,643.

BP Chemicals International Limited: *See—*
Holliday, Gilbert John; and Norris, John, 3,953,389.

Bradley, Earl H., to General Signal Corporation. Stabilization of waste material. 3,953,331, Cl. 210-63.00R.

Braguier, Michel: *See—*
Bejat, Jean; Braguier, Michel; Tucta, Roger; Vistosi, Raoul; Verna, Maurice; Aubin, Gerard F.; and Naturel, Christian, 3,953,704.

Brandenburg, John T.: *See—*
Peck, Reese A.; Mih, Li C.; and Brandenburg, John T., 3,953,320.

Brandt, Wilhelm; and Bindrum, Irmgard, to Hoechst Aktiengesellschaft. Copper coatings on shaped plastic supports. 3,953,658, Cl. 428-458.000.

Brantingham, George L., to Texas Instruments Incorporated. Latched decoder for digit outputs to an electronic digital calculator display. 3,953,719, Cl. 235-156.000.

Braukmann, Bernhard W. Thermostatic valve. 3,952,946, Cl. 236-34.000.

Braun Aktiengesellschaft: *See—*
Roth, Johann; and Flandorfer, Robert, 3,953,116.

Braun, John D.; Pickett, M. Frank; Gerrish, Howard W., Jr.; and Jonassen, Hans B., to United States of America, Navy. Gossypol, an abundant, low-cost iron deactivator, pot-life extender, and processing aid for HTPB propellants. 3,953,260, Cl. 149-19.920.

Braunschweigische Maschinenbauanstalt: *See—*
Dietzel, Walter; and Matusch, Siegfried, 3,953,224.

Brax, Harri J.; Porinchak, Joseph F.; and Weinberg, Alan S., to W. R. Grace & Co. Polymer film with narrow molecular weight distribution and saran and laminates thereof. 3,953,557, Cl. 264-22.000.

Bray, William Edward, to Texas Instruments Incorporated. Motion control system for an inductively controlled multi-phase motor. 3,953,778, Cl. 318-685.000.

Bremer, Richard J., to General Motors Corporation. Adaptive anti-lock brake control system. 3,953,080, Cl. 303-21.0BE.

Bremstahler, Manfred, to Stettner & Co., Firma. Multiple trimmer capacitor, particularly for adjustment of crystal oscillators. 3,953,771, Cl. 317-248.000.

Brennan, John J.; and Bornstein, Norman S., to United Technologies Corporation. Graphite fiber reinforced metal matrix composite. 3,953,647, Cl. 428-378.000.

Bretl, Robert: *See—*
Manske, Warren C.; Bretl, Robert; and Dupont, Donald, 3,952,591.

Bridgeport Chemical Corporation: *See—*
Bergman, Carl, 3,952,920.

Bridges, Donald W.: *See—*
Fassell, W. Martin; and Bridges, Donald W., 3,953,502.

Bridgestone Tire Company Limited: *See—*
Okado, Yosuke; Fujikawa, Hiroshi; and Takusagawa, Takashi, 3,952,787.

Bridon Engineering Limited: *See—*
Hart, John Charles Humphreys, 3,952,996.

Brignola, Dominic J.: *See—*
Pickerell, Fred T.; and Brignola, Dominic J., 3,952,897.

Brink, Edward C., Jr.: *See—*
Chesluk, Ralph P.; Platte, Howard J.; and Brink, Edward C., Jr., 3,953,319.

Britax (London) Limited: *See—*
Burleigh, David William, 3,952,966.

British Industrial Plastics Limited: *See—*
Ogden, Dennis H.; and Inverarity, George, 3,952,907.

British Nuclear Fuels Limited: *See—*
Watson, Ronald Henry; Butler, Gregg Glenn; Heal, Thomas John; and Littlechild, James Edgar, 3,953,286.

Britz, Hans Ernst. Opto-electronic antenna system for lasers. 3,953,131, Cl. 356-141.000.

Brockman, Furn O. Lawn rake. 3,952,490, Cl. 56-400.140.

Bron, Osip Borisovich; Molchanov, Valentin Danilovich; Shifrin, Lev Notovich; and Freivald, Adolf Rudolfovich. Heavy current switch. 3,953,695, Cl. 200-150.00C.

Brooks, Arthur D.: *See—*
United States of America, National Aeronautics and Space Administration; Wortman, Jimmie J.; Donovan, Robert P.; Brooks, Arthur D.; Monteith, Larry K.; Kinard, William H.; and O'Neil, Robert L., 3,953,792.

Brophy, Thomas G.; Crowell, Douglas H.; and Hollick, John G., to USM Corporation. Tear seal apparatus. 3,953,280, Cl. 156-515.000.

Brower, Bernard C.: *See—*
LaPine, Robert L.; and Brower, Bernard C., 3,952,371.

Brown, Alistair Chalmers Ramsay; Dykes, Norman Andrew; January, John Kenneth; and Lake, Ivan James Samuel, to Imperial Chemical Industries Limited. Catalyst treatment. 3,953,536, Cl. 260-668.00A.

Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft: *See—*
Uhlig, Klaus, 3,952,777.

Brown International Corporation: *See—*
Holbrook, Franklin K.; and James, Donald R., 3,952,647.

Brown, Leon Henry, Jr., to Wangco Incorporated. Cabinet configuration for loading disc drive apparatus. 3,953,094, Cl. 312-303.000.

Brown, Newton D.: *See—*
United States of America, National Aeronautics and Space Administration; Brown, Newton D.; Jeppesen, Gordon L.; and Costakos, Nicholas C., 3,952,976.

Brown, Patrick R.; and Buehler, Max A., to Weelpal, A. G. Rail trackway fitted with braking devices. 3,952,839, Cl. 188-62.000.

Brown, Russel William, to Northern Electric Company, Limited. Digital control of a loudspeaking telephone system. 3,953,676, Cl. 179-1.0HF.

Brownhill, Edward Joseph; Heaton, Roy; and Booth, Ralph, to Renold Limited. Sprag clutches. 3,952,849, Cl. 192-41.00A.

Browning Engineering Corporation: *See—*
Browning, James A., 3,952,723.

Browning, James A., to Browning Engineering Corporation. Windmills. 3,952,723, Cl. 126-247.000.

Brownlie, Alan; and Daly, Lewis J., to American Challenger Corporation. Marine drive. 3,952,687, Cl. 115-41.00R.

Broxholm, Thomas M.: *See—*
Elmore, Lester C.; and Broxholm, Thomas M., 3,952,832.

Broyles, Howard F. Electrically fired superimposed projectile. 3,952,658, Cl. 102-40.000.

Brozkova, Marie: *See—*
Junek, Jan; Ripka, Josef; Vobornik, Vaclav; Hortlik, Frantisek; Jaros, Frantisek; Elias, Jiri; Brynda, Vaclav; Mares, Karel; Kotrba, Zdenek; Lihtarova, Ludmila; Brozkova, Marie; and Rehackova, Bozena, 3,952,494.

Brubacher, Leonard M. G., to Raymond Lee Organization, Inc., The, a part interest. Water tumbler and roller float. 3,953,024, Cl. 272-1.00E.

Brulfert, Andre. Hot-fluid generator using catalytic combustion. 3,952,707, Cl. 122-367.00R.

Brun, Robert; and Pages, Michel, to Rhone-Poulenc, S.A. Fluid fractionating apparatus. 3,953,334, Cl. 210-321.00R.

Brundrit, Dennis R.; and van Wijnen, Jacobus C., to Shell Oil Company. Super long seismic source. 3,953,826, Cl. 340-7.0PC.

Brunetti, Heimo: *See—*
Orban, Ivan; Lind, Hanns; Brunetti, Heimo; and Rody, Jean, 3,953,459.

Brunner, Julius; Schwendtner, Manfred; and Steinmuller, Gunter, to Siemens Aktiengesellschaft. Transformerless kilowatthour meter for an electrical power line. 3,953,795, Cl. 324-142.000.

Brunswick Corporation: *See—*
Anderson, Edward P.; and Harris, Mark, 3,953,742.
Epstein, Sheldon L.; and Wessling, Bernard W., 3,953,237.
Meyer, James A., 3,952,718.

Brushenko, Anatoli, to GAF Corporation. Reset mechanism for an audio-visual device. 3,953,118, Cl. 353-19.000.

Brussieux, Pierre Jules Henry: *See—*
Bernard, Jean-Paul; Brussieux, Pierre Jules Henry; Jumelle, Louis Francois; and Simonin, Jean Lucien, 3,952,831.

Bryant, Elmer E. Reciprocating mower shoe attachment. 3,952,486, Cl. 56-303.000.

Brynda, Vaclav: *See—*
Junek, Jan; Ripka, Josef; Vobornik, Vaclav; Hortlik, Frantisek; Jaros, Frantisek; Elias, Jiri; Brynda, Vaclav; Mares, Karel; Kotrba, Zdenek; Lihtarova, Ludmila; Brozkova, Marie; and Rehackova, Bozena, 3,952,494.

Buckler Industries, Inc.: *See—*
Hovekamp, John C., 3,953,225.

Buehler, Max A.: *See—*
Brown, Patrick R.; and Buehler, Max A., 3,952,839.

Buess, Charles Merlyn: *See—*
Flickinger, Earl Dan; and Buess, Charles Merlyn, 3,953,426.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,953,508.

Buglewicz, Neal, to Phone-Mate. Telephone answering device utilizing Mobius loop activating switch. 3,953,679, Cl. 179-6.00R.

Bulboaca, Mihai A.: *See—*
Babunovic, Momir; and Bulboaca, Mihai A., 3,952,925.

Bullat, David M.: *See—*
Stull, Bertram O.; and Bullat, David M., 3,952,505.

Buller, J. Stanley, to Hughes Aircraft Company. Quick cooling cryostat with valve utilizing Simon cooling and Joule Thompson expansion. 3,952,543, Cl. 62-514.0JT.

Bunker Ramo Corporation, The: *See—*
Albee, Thomas K., 3,953,799.
Avery, Roger Peter; and Zerlin, William Max Erich, 3,953,098.
Nijman, John Peter; and Patterson, Terence Neil, 3,952,392.
Palecek, Vincent James, 3,953,101.
Wilson, William Dean, 3,953,099.

Bunri Kogyo Kabushiki Kaisha: *See—*
Nazuka, Iwao, 3,952,857.

Burke, Ronald Patrick, to Fitzwilton Limited. Film folding machine. 3,953,019, Cl. 270-61.00F.

Burkett, Bobby G.; and Henry, Raymond W., to Texas Instruments Incorporated. Programmable logic controller with push down stack. 3,953,834, Cl. 340-172.500.

Burleigh, David William, to Britax (London) Limited. Seat belt storage reel with electrically operated locking device. 3,952,966, Cl. 242-107.40R.

Burley, Harvey A., to General Motors Corporation. Rotor mounted spark plug for rotary engine. 3,952,708, Cl. 123-8.090.

Burns, Robert: *See—*
Roberts, William Gary; and Burns, Robert, 3,953,630.

Burns, Robert A., to Engelhard Minerals & Chemicals Corporation. Enzymes bound to heat-activated attapulgite clay. 3,953,292, Cl. 195-63.000.

Burris, Clarence C.: *See—*
Kurkowski, Leonard S.; and Burris, Clarence C., 3,952,612.

Burroughs Corporation: *See—*
Gilberg, Robert Charles; and Young, Frank Chung-Yai, 3,953,838.
Kelhm, William G., Jr., 3,953,663.
Kobylarz, Lawrence P.; and Mack, Ronald H., 3,953,887.

Burton, Robert S., III, to Occidental Petroleum Corporation. Method for igniting oil shale retort. 3,952,801, Cl. 166-256.000.

Buss, Herman, to Lawrence Peska Associates, Inc., a part interest. Large wheel roller skate. 3,953,041, Cl. 280-11.260.

Butherus, Alexander Duane; and Terry, Milton Everett, to Bell Telephone Laboratories, Incorporated. Method for the production of carbonyl iron containing magnetic devices with selected temperature variation. 3,953,251, Cl. 148-105.000.

Butler, Gregg Glenn: *See—*
Watson, Ronald Henry; Butler, Gregg Glenn; Heal, Thomas John; and Littlechild, James Edgar, 3,953,286.

Buurman, Herman; and Romberg, Hendrik, to U. S. Philips Corporation. Apparatus for shearing and transferring a glass charge. 3,953,189, Cl. 65-207.000.

Byrd, Carlisle O., Jr., to J T Thorpe Company. Furnace lining apparatus. 3,952,470, Cl. 52-509.000.

C.G.R.-Mev.: *See—*
Tran, Duc Tien, 3,953,758.

C.J.I. Industries, Inc.: *See—*
Rozner, Allan, 3,952,552.

Cabot Corporation: *See—*
Berstein, Gregor, 3,953,421.
Herchenroeder, Robert B., 3,953,579.

Cain, James F. Method and device for clearing a stopped up drain. 3,952,341, Cl. 4-255.000.

Cala, Francis R., to Colgate-Palmolive Company. Manufacture of improved aqueous alkali metal silicate-alkali metal hydroxyalkyl iminodiacetate compositions. 3,953,379, Cl. 252-527.000.

Caldwell, Edward N., to Robertshaw Controls Company. Multiple low pressure selector relay and method of making the same. 3,952,760, Cl. 137-82.000.

Calgon Corporation: *See—*
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Darlington, R. Keith; Gwynn, John Wallace; and Hall, Stephen H., Sr., to N L Industries, Inc. Removal of boron from $MgCl_2$ brines. 3,953,572, Cl. 423-158.000.
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Delavarenne, Serge; Weiss, Francis; and Schirmann, Jean-Pierre, to Produits Chimiques Ugine Kuhlmann. Epoxidation of olefins by hydrogen peroxide. 3,953,480, Cl. 260-348.50L.
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Dillman, Richard F.; Larsen, James L.; and Nardizzi, Alfred M., to Hewlett-Packard Company. Electrocardiograph telemetry system including method and means for indicating inoperative conditions. 3,953,848, Cl. 340-409.000.
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England, Herbert C., Jr.; and Voigt, William C., Jr. Motionless mixing device. 3,953,002, Cl. 259-4.0AB.

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Erath, Robert L.; Speidel, Mathias A.; and Kennelly, Edward J., to Grumman Aerospace Corporation. Variable buoyancy device. 3,952,349, Cl. 9-8.00R.

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Erickson, Clifford E., to General Electric Company. Hinge structure. 3,952,369, Cl. 16-171.000.

Eriksson, Nils Borje; and Tidemalm, Gustav Hilmer, to AB Bofors. Device used as a power transmission component for elevation of a gun barrel. 3,952,632, Cl. 92-117.00R.

Erkenbrack, Kenneth B., to New Products, Inc. Curved pin and inserter. 3,952,935, Cl. 227-120.000.

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Garcia, Onofre S. Container type molding device of matched segments. 3,952,990, Cl. 249-63.000.
Gardiner, Franklyn A.; Hawkins, Oscar M.; and Grace, Garland K., to Thiokol Corporation. Slot former assembly for use in solid propellant rocket motors. 3,952,627, Cl. 86-1.00R.
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Gause, Lawrence J., to Crouse, Otho C., a part interest. Perfume or cologne dispenser. 3,952,917, Cl. 222-78.000.
Geck, Hans Gunther; and Langhammer, Jurgen, to Klockner-Werke AG. Production of carburized iron. 3,953,197, Cl. 75-48.000.
Gee, Ted F., to General Motors Corporation. Turbine blade with configured stalk. 3,952,391, Cl. 29-156.80R.
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Ginnasi, Alessandro; Vetere, Alessandro; and Martera, Pierantonio, to Snam Progetti, S.p.A. Process for separating a high purity vinyl aromatic hydrocarbon from hydrocarbon mixtures containing the same. 3,953,300, Cl. 203-53.000.
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Griggs, Edwards A. Temperature change sensing device. 3,952,692, Cl. 116-102.000.

Grihangne, Andre, to Ste Superflexit. Flexible marine transport tank. 3,952,679, Cl. 114-74.00T.

Grimmett, Howard L.: *See—*
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Gurkov, Konstantin Stepanovich: *See—*
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Habiger, Cyril W.; McMillan, William D.; Persson, David L.; and Ferre, Glenn E., deceased (by Ferre, Marjorie E., legal representative and executrix), to Caterpillar Tractor Co. Speed and load responsive underspeed actuator for hydrostatic transmissions. 3,952,515, Cl. 60-447.000.
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Joubert, Pierre-Rene, to Raymond Lee Organization, Inc., The, a part interest. Vehicle registration and velocity display device. 3,952,689, Cl. 116-57.000.

Jouffret, Michel: *See—*
Bost, Pierre; Constantini, Michel; Jouffret, Michel; and Lartigau, Guy, 3,953,527.

Jousson, Pierre-Jean: *See—*
Moret, Michel Antoine; Jousson, Pierre-Jean; and Musy, Jean-Pierre, 3,952,736.

Judice, Charles Norris, to Bell Telephone Laboratories, Incorporated. Method and arrangement for eliminating flicker in interlaced ordered dither images. 3,953,668, Cl. 178-6.000.

Juhasz, Attila: *See—*
Kisfaludy, Lajos; Low, Miklos; Schon, Istvan; Szirtes, Tamas; Sarkozi, Maria Sz.; Bajusz, Sandor; Turan, Andrae; Beks, Rosa; Juhasz, Attila; Graf, Laszlo; Medzihradszky, Kalman; and Szporny, Laszlo, 3,953,415.

Juki Co., Ltd.: *See—*
Hirayama, Tetsuro, 3,952,674.

Julian, Gabriel L.: *See—*
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Jumelle, Louis Francois: *See—*
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Junek, Jan; Ripka, Josef; Vobornik, Vaclav; Hortlik, Frantisek; Jaros, Frantisek; Elias, Jiri; Brynda, Vaclav; Mares, Karel; Kotrba, Zdenek; Lihtarova, Ludmila; Brozkova, Marie; and Rehackova, Bozena, to Vyzkumny ustav bavlnarsky. Open-end spinning unit with a spinning rotor. 3,952,494, Cl. 57-58.890.

Junker, Bernhard T.: *See—*
Golland, David I.; Junker, Bernhard T.; O'Connor, Gary E.; and Runkle, Charles J., 3,953,250.

Jusov, Mikhail Ivanovich: *See—*
Kulyabko, Valery Anatolievich; Evstigneeve, Nikolai Andreevich; Petrov, Fedor Romanovich; Pleshivtsev, Anatoly Petrovich; Somov, Vasily Ivanovich; Cherkasov, Leonid Mikhailovich; Jusov, Mikhail Ivanovich; Sivkov, Alexandr Alexandrovich; and Lazarev, Robert Nikolaevich, 3,953,077.

Justice, James W. H.; and Newell, George F. Television system for simultaneously transmitting and receiving a plurality of independent pictures on a single carrier screen. 3,953,666, Cl. 178-5.600.

Justrite Manufacturing Company: *See—*
Flider, Frank S., 3,953,723.

Kaarsmaker, Hendrik, to Mobil Oil Corporation. Intake piece adapted for emptying containers with liquid. 3,952,772, Cl. 137-565.000.

Kabchef, Robert G. Toy airplane. 3,952,448, Cl. 46-78.000.

Kabushiki Kaisha Hoya Lens: *See—*
Iizuka, Tadashi, 3,953,130.

Kabushiki Kaisha Saginomiya Seisakusho: *See—*
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Kabushiki Kaisha Sokkisha: *See—*
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Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Miyazaki, Tsutomu; Kato, Takashi; Yoshizawa, Toshio; and Yamada, Yasuo, 3,952,492.

Kafunek, Pavel: *See—*
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Kaiser Aluminum & Chemical Corporation: *See—*
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Kaiser, Hans: *See—*
Kratel, Gunther; Stohr, Gunter; Vogt, Georg; and Kaiser, Hans, 3,953,487.

Kakihana, Hidetake: *See—*
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Seko, Maomi; and Kakihana, Hidetake, 3,953,569.

Kaliher, Paul L.; Nelson, Fred W.; and Roos, Bryan K., to Minnesota Mining and Manufacturing Company. Electrosurgical system providing a fulguration current. 3,952,748, Cl. 128-303.140.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Diphenylamines for dyeing keratinous fibers. 3,953,508, Cl. 260-562.00A.

Kaltenbach & Voigt: *See—*
Lingenhole, Bernhard, 3,952,416.

Kaltmann, Hans-Joachim, to Rheinmetall GmbH. Rifle cartridge. 3,952,657, Cl. 102-38.000.

Kamada, Hatohiko; and Tashiro, Koichi, to Fuji Photo Film Co., Ltd. Process for the manufacture of mesh screen for X-ray photography sensitization. 3,953,303, Cl. 204-15.000.

Kaminski, Joseph F., to Raymond Lee Organization, Inc., The, a part interest. Fishing reel accessory. 3,952,443, Cl. 43-25.000.

Kan, Yih-Renn, to General Motors Corporation. Metallurgical vessel. 3,953,009, Cl. 266-283.000.

Kanai, Hukashi; Mori, Yasuo; and Toyoda, Kyoichi, to Nissan Motor Company, Limited. Collapsible spacer in final drive unit of motor vehicle. 3,952,608, Cl. 74-411.000.

Kanbe, Masaki: *See—*
Inoue, Shohei; Kanbe, Masaki; Takada, Tadamichi; Miyazaki, Nobuyuki; and Yokokawa, Masanori, 3,953,383.

Kane, Daniel E., to SCM Corporation. Bond-like copy paper by cockling after coating or imaging. 3,953,208, Cl. 96-1.500.

Kanebo Kabushiki Kaisha: *See—*
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Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
Hatano, Itaru; Hara, Minoru; Kitamura, Tsuneo; Ando, Akira; and Suganuma, Yasuyuki, 3,953,558.
Suzuki, Kazuo; Hayashi, Yoshiaki; and Nagamine, Seiichi, 3,953,649.

Kaneko, Yasuo: *See—*
Meguerian, Garbis H.; and Kaneko, Yasuo, 3,953,576.

Kantorowicz, Gerard, to Thomson-CSF. Acoustic storage device for high-frequency electrical signals. 3,953,836, Cl. 340-173.0MS.

Kao Soap Co., Ltd.: *See*—
Fujino, Takashi; Nishimura, Masaaki; and Yamanaka, Makoto, 3,953,350.
Funatsu, Makoto; Yasuda, Shinichiro; and Hiraizumi, Toshimitu, 3,953,384.
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Karavaev, Andron Trofimovich: *See*—
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Karl Lautenschlaeger KG: *See*—
Lautenschlaeger, Karl, Jr., 3,952,364.
Karon, Marc A.: *See*—
Latvala, Bruce E.; and Karon, Marc A., 3,953,083.
Karr, Michael A., Jr. Throttling and shut-off valve. 3,952,994, Cl. 251-210.000.
Kason Hardware Corporation: *See*—
Berkowitz, Irving L., 3,952,542.
Kasubuchi, Takeshi: *See*—
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 3,953,860.
Kasyanov, Grigory Ivanovich: *See*—
Bashinsky, Kazimir Dominikovich; Golod, Leonid Davidovich; Granovsky, Boris Ruvimovich; Dunaevsky, Leonid Markovich; Kasyanov, Grigory Ivanovich; and Kudinov, Gennady Alexandrovich, 3,953,008.
Katagiri, Katuo: *See*—
Ooka, Isami; Tomihisa, Noboru; Nogami, Yoshio; and Katagiri, Katuo, 3,953,577.
Katakura, Kageyoshi, to Hitachi Medical Corporation. Velocity measurement apparatus using pulsed ultrasonic waves. 3,953,823, Cl. 340-1.00R.
Kato, Kiyoshi: *See*—
Fujimura, Hajime; Hori, Mikio; Ootani, Osamu; Ohno, Sachio; Kitamikado, Tadashi; Kato, Kiyoshi; and Nagasaka, Mitsuaki, 3,953,467.
Kato, Takashi: *See*—
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Kato, Yasuo: *See*—
Furuhata, Yoshio; Kato, Yasuo; and Abe, Zenmon, 3,953,503.
Katzman, Allison W.; and Barlow, Gordon A., to Marvin Glass & Associates. Card matching apparatus including dispenser. 3,953,027, Cl. 273-1.00R.
Kawagoe, Hiroto, to Hitachi, Ltd. Circuit for converting an asynchronous signal with a long transition time to a synchronized signal. 3,953,744, Cl. 307-208.000.
Kawahara, Norio: *See*—
Murakami, Masuo; Isaka, Ichiro; Koda, Akio; Kawahara, Norio; Ashiwagi, Teruya; Murakami, Yukiyasu; Yano, Kuniichiro; Nakano, Kohzi; and Souzo, Isao, 3,953,428.
Kawai, Kiyohisa: *See*—
Noguchi, Shunsaku; Aono, Tetsuya; Araki, Yoshiaki; and Kawai, Kiyohisa, 3,953,500.
Kawakami, Genichi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument capable of generating tone signals having pitch frequency, tone color and volume envelope varied with time. 3,952,624, Cl. 84-1.260.
Kawamoto, Hirohisa; and Miller, David Joseph, to RCA Corporation. Injection laser modulator. 3,953,809, Cl. 331-94.50H.
Kawamura, Tomoaki; Ohtaki, Syohei; Nakamoto, Soichi; and Takahashi, Kiyoshi, to Canon Kabushiki Kaisha. Device for recording camera data. 3,953,868, Cl. 354-109.000.
Kawarada, Junji; Endo, Kunio; Harada, Susumu; and Sueishi, Motoharu, to Nippondenso Co., Ltd. Air-fuel ratio control system for internal combustion engines. 3,952,710, Cl. 123-32.0EA.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Nakano, Hideaki; Ozu, Tadahiro; and Okayama, Takashi, 3,952,546.
Kawase, Shoji; Shima, Takeo; Inata, Hiroo; and Kurisu, Shizuka, to Teijin Ltd. Aromatic polyester resin composition having inhibited coloration and method for inhibiting coloration. 3,953,539, Cl. 260-860.000.
Kawashima Orimono Co., Ltd.: *See*—
Matsuda, Yujiro; and Nakamura, Kazuchika, 3,953,271.
Kawecki Berylco Industries, Inc.: *See*—
Rasmussen, Robert T. C., 3,953,202.
Kay Laboratories, Inc.: *See*—
Watson, William K. R., 3,952,519.
Kayama, Kunifusa: *See*—
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Kayama, Ryuichi: *See*—
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Kazimir, Edward O.; and Weintritt, Donald J., to N L Industries, Inc. Removal of boron from $MgCl_2$ brines. 3,953,573, Cl. 423-161.000.
Keeler Brass Company: *See*—
Little, Carl H., 3,952,605.
Keerie, Donald; Hammond, John Anthony Gordon; and Hamey, Peter Michael, to Sperry Rand Limited. Flow sensors. 3,953,819, Cl. 338-36.000.
Kel-Win Manufacturing Co., Inc.: *See*—
Keller, Robert J., III, 3,952,764.
Kelch, Heinz, to Kienzle Apparate GmbH. Electronic taximeter for taxis taking a plurality of passengers on overlapping trips. 3,953,720, Cl. 235-168.000.
Kelhm, William G., Jr., to Burroughs Corporation. Vacuum-heat treated printed circuit boards. 3,953,663, Cl. 174-68.500.
Keller, Arnold Arie, to Lever Brothers Company. Liquid laundry detergent. 3,953,351, Cl. 252-132.000.
Keller, Charles Robert; and Martin, William D. Wire pulling apparatus. 3,952,999, Cl. 254-134.30R.
Keller, Robert J., III, to Kel-Win Manufacturing Co., Inc. Single lever faucet construction. 3,952,764, Cl. 137-119.000.
Keller, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for measuring electrical conductivity. 3,953,796, Cl. 324-158.00R.
Kelley, Robert George: *See*—
Ruf, Walter; and Kelley, Robert George, 3,953,020.
Kelly Bros. (Northampton) Limited: *See*—
Goldry, Philip Edward; and Skinner, Keith Thomas, 3,952,384.
Kelly, Norman A.; and Libert, Norris R. Golfer's putting stance analyzing device. 3,953,033, Cl. 273-183.00E.
Kelver, William L.; Stuckey, Ronald L.; and Rozema, Arthur L., to CTS Corporation. Variable resistance control. 3,953,821, Cl. 338-174.000.
Kemp, Clifford B., to Procter & Gamble Company, The. Multi-ply absorbent wiping product having relatively inextensible center ply bonded to highly extensible outer plies. 3,953,638, Cl. 428-154.000.
Kendall Company, The: *See*—
Libman, Gary; and Villari, Frank K., 3,952,729.
Kendall, W. Denis: *See*—
Yarger, Frank A., 3,952,751.
Kennametal Inc.: *See*—
Friedline, Ernest J.; Mitchell, Robert N.; and Andras, Linn R., 3,953,143.
Kennedy, Carl D.: *See*—
Kerfoot, Oliver C.; Clark, Charles R.; and Kennedy, Carl D., 3,952,803.
Kennelly, Edward J.: *See*—
Erath, Robert L.; Speidel, Mathias A.; and Kennelly, Edward J., 3,952,349.
Kerff, Anton, to Aktiebolaget IRO. Yarn feed stop motion. 3,952,554, Cl. 66-163.000.
Kerfoot, Oliver C.; Clark, Charles R.; and Kennedy, Carl D., to Continental Oil Company. Oil recovery method using overbased waterflood additive containing sulfonates derived from alkylation reaction products. 3,952,803, Cl. 166-270.000.
Kern, Edmund R., to International Telephone and Telegraph Corporation. Method for preparing emissive coating for electrodes. 3,953,376, Cl. 252-521.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Korr, Heinrich; Maas, Douwe; and Telemann, Gerhard, 3,953,690.
Ketler, Albert E.; Campbell, Ronald P.; and Shacreaw, George, to Ocean Energy, Inc. Illuminating apparatus. 3,953,725, Cl. 240-51.11R.
Key, Alan, to National Research Development Corporation. Instrument for use in the measurement of blood gases. 3,952,730, Cl. 128-2.00G.
Khomyakov, Igor Stepanovich; and Leinek, Albert Arturovich. Apparatus for ringless spinning of fibers. 3,952,493, Cl. 57-58.890.
Khoury, Nick S., to Continental Can Company, Inc. Tab anti-rotation and hold down device. 3,952,913, Cl. 220-273.000.
Kicher, Thomas P.: *See*—
Mergler, Harry W.; Wright, Daniel K.; Kicher, Thomas P.; Savage, Michael; and Kosc, Wieslaw, 3,952,572.
Kidd, Patrick Michael, to Mackley-Ace Limited. Cable drums. 3,952,962, Cl. 242-54.00R.
Kienzle Apparate GmbH: *See*—
Kelch, Heinz, 3,953,720.
Kihlstedt, Per Gudmar; and Forssberg, Knut Sven Eric, to Advanced Mineral Research. Method for producing high alumina refractory material. 3,953,563, Cl. 264-66.000.
Kikkawa, Takahiro; and Hirata, Toshinori, to Mitsui Mining & Smelting Co., Ltd. Apparatus for peeling electrodeposited metal off cathode base plate. 3,953,312, Cl. 204-198.000.
Kim, Dong Guen; and Dubro, Gary Arnold, to United States of America, Air Force. Optical convolution velocimeter. 3,953,126, Cl. 356-28.000.
Kimberley, John A.; and Kraus, Richard D., to Ambac Industries, Inc. Diesel injection nozzle with independent opening and closing control. 3,952,711, Cl. 123-32.0JV.
Kimberly-Clark Corporation: *See*—
Aldinger, Karl E., 3,952,744.
Kimmell, Garman O., Jr. Filter and filter insertion instrument. 3,952,747, Cl. 128-303.00R.
Kimura, Ichiro: *See*—
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Kimura, Kazuo: *See—*
Igarashi, Seiichi; Shirakawa, Kin-ichi; Kimura, Kazuo; and Ogino, Akira, 3,953,169.
Kimura, Shinichi. Device for separating air bubbles of fluids in piping, and silencing water flow. 3,952,765, Cl. 137-171.000.
Kinard, William H.: *See—*
United States of America, National Aeronautics and Space Administration; Wortman, Jimmie J.; Donovan, Robert P.; Brooks, Arthur D.; Monteith, Larry K.; Kinard, William H.; and O'Neil, Robert L., 3,953,792.
Kindl, George F., to Loc-Rite, Incorporated. Hanger rod having spring loaded suction cup. 3,952,877, Cl. 211-105.500.
King, William Roy. Antilocking braking system. 3,953,081, Cl. 303-21.0CH.
Kino, Gordon S.; Quate, Calvin F.; and Havlice, James F., to Leland Stanford Junior University, The Board of Trustees of. Electronically focused imaging system and method. 3,953,825, Cl. 340-5.0MP.
Kinoshita, Ikuma: *See—*
Takano, Sho; Okuyama, Yasushi; Suzuki, Ryokuya; and Kinoshita, Ikuma, 3,952,816.
Kinser, Vernon. Yieldable horseshoe stake. 3,953,031, Cl. 273-104.000.
Kinsey, Lewis R. Multi-layer walls for frameless buildings formed from extruded aluminum or plastic interlocking wall elements. 3,952,461, Cl. 52-57.000.
Kipling, Barry John, to Rank Xerox, Ltd. Recording stylus. 3,953,861, Cl. 346-139.00C.
Kirby, Clifton A.: *See—*
von Pragenau, George L.; Morgan, Irvin T., Jr.; and Kirby, Clifton A., 3,952,980.
Kirby, Fred E.: *See—*
Wanker, William C.; Quinn, James J.; and Kirby, Fred E., 3,952,889.
Kirchner, Henry P., to Ceramic Finishing Company. Method of improving impact resistance of ceramic bodies, and improved bodies. 3,953,636, Cl. 428-155.000.
Kisfaludy, Lajos; Low, Miklos; Schon, Istvan; Szirtes, Tamas; Sarkozi, Maria Sz.; Bajusz, Sandor; Turan, Andrae; Beks, Rosa; Juhasz, Attila; Graf, Laszlo; Medzihradszky, Kalman; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of biologically active polypeptides containing aspartyl group. 3,953,415, Cl. 260-112.50R.
Kishimoto, Shinzo: *See—*
Miyano, Shizuo; Kondo, Asaji; Kishimoto, Shinzo; and Yazawa, Kenichiro, 3,953,212.
Kitamikado, Tadashi: *See—*
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Kitamura, Tsuneo: *See—*
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Kittrell, James R.: *See—*
Jaffe, Joseph; and Kittrell, James R., 3,953,364.
Klaue, Hermann. Spreading disc brake and actuator structure. 3,952,842, Cl. 188-71.400.
Klein, Andre, to Polycrate (Proprietary) Limited. Method of injection molding structural foam folding slat structures. 3,953,560, Cl. 264-50.000.
Klein, Gehart P., to P. R. Mallory & Co. Inc. Method of making an anode. 3,953,204, Cl. 75-211.000.
Klein, Johannes; Schneider, Wolfgang; and Fetzer, Karl, to KSB Kernkraftwerkspumpen GmbH. Method and means for accurately aligning the axes of shafts in pump assemblies or the like. 3,952,547, Cl. 64-9.00R.
Klemm, Richard O., to Food Warming Equipment Company. Food warming cabinet humidifier. 3,952,609, Cl. 99-474.000.
Klieger, Erich; Beich, Wolfgang; and Schroder, Eberhard, to Schering Aktiengesellschaft. Triiodoisophthalic acid monoamino acid amides. 3,953,501, Cl. 260-518.00A.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Age resistant polymeric compositions. 3,953,398, Cl. 260-45.85B.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Age resistant polymers of ditertiary alkyl-4-hydroxyaryl acrylate and dienes. 3,953,402, Cl. 260-62.000.
Kline, Richard H., to Goodyear Tire & Rubber Company, The. Age resistant polymers of 4-(arylamino)aryl esters of α,β unsaturated carboxylic acids. 3,953,411, Cl. 526-312.000.
Klingler, Josef F. Safety ashtray. 3,952,753, Cl. 131-235.00R.
Klipfel, Siegfried: *See—*
Weber, Karl-Arnold; Wagner, Kuno; and Klipfel, Siegfried, 3,953,559.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
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Schonbeck, Rupert; Kloimstein, Engelbert; Diskus, Alfred; Auer, Engelbert; and Mayr, Hubert, 3,953,445.
Klopfenstein, Floren R.: *See—*
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Kmecak, Ronald A.: *See—*
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Knapp, Heinrich; and Jaggle, Gunther, to Robert Bosch GmbH. Fuel injection system. 3,953,548, Cl. 261-50.00A.
Knobloch, James O.; and Ramirez, Fausto, to Standard Oil Company. Diacylium complexes of tetrahaloterephthalic acid. 3,953,481, Cl. 260-350.00R.
Knoth, Dale W.: *See—*
Lipson, Melvin A.; and Knoth, Dale W., 3,953,214.
Knudson, LeRoy Andrew. Bale loader. 3,952,881, Cl. 214-6.00B.
Ko Kondo: *See—*
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Kobayashi, Kenji: *See—*
Atsumi, Toshio; Kobayashi, Kenji; Takebayashi, Yoshiaki; and Yamamoto, Hisao, 3,953,441.
Kober, Ehrenfried H.: *See—*
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Kobori, Sigeyuki: *See—*
Amano, Matsuo; Suzuki, Seiko; Kobori, Sigeyuki; and Kimura, Ichiro, 3,953,692.
Kobylarz, Lawrence P.; and Mack, Ronald H., to Burroughs Corporation. Spring driven velocity controlled magnetic stripe reader. 3,953,887, Cl. 360-2.000.
Koch, Hans W., to Roller Bearing Company of America. Lock for the inner race of self-aligning bushing on a shaft. 3,953,141, Cl. 403-259.000.
Koda, Akio: *See—*
Murakami, Masuo; Isaka, Ichiro; Koda, Akio; Kawahara, Norio; Ashiwagi, Teruya; Murakami, Yukiyasu; Yano, Kuniichiro; Nakano, Kohzi; and Souzo, Isao, 3,953,428.
Kodama, Hayashi: *See—*
Tomita, Tamaki; Ishikawa, Mineo; Kodama, Hayashi; and Moriya, Kazuo, 3,952,458.
Kodis, Rudolfs, to Phillips Fibers Corporation. Tension control and drive apparatus for a fabric loom. 3,952,779, Cl. 139-110.000.
Koenig & Bauer Aktiengesellschaft: *See—*
Bolza-Schunemann, Hans Bernhard, 3,952,651.
Koeslin, Werner H., to Caterpillar Tractor Co. Fluid damped resilient drive for a governor. 3,952,545, Cl. 64-27.00C.
Kofabco, Inc.: *See—*
Striebel, Kenneth H., 3,953,071.
Kogure, Akira: *See—*
Komatsu, Koei; Nishiyama, Shigeyuki; Sakabe, Nobuyuki; and Kogure, Akira, 3,953,409.
Kohl, Karl. Guidebar compensation apparatus for use on warp knitting machines equipped with jacquard controls. 3,952,549, Cl. 66-86.00E.
Kohl, Karl. Self-aligning apparatus for use on a wrap knitting machine. 3,952,551, Cl. 66-120.000.
Kohler, Fritz, to Edouard Dubied et Cie (Societe Anonyme). Stopping apparatus for a rectilinear knitting machine. 3,952,553, Cl. 66-157.000.
Kohler, Werner: *See—*
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Kojima, Katue: *See—*
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Kojima, Saburo: *See—*
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Kokusai Electric Co., Ltd.: *See—*
Nagashima, Toshio; Imaguchi, Ichiro; and Igarashi, Shigeo, 3,953,662.
Kolesar, Joseph J. Car crane. 3,952,893, Cl. 214-450.000.
Kolibas, James A., to Addressograph Multigraph Corporation. Handling of originals to be photocopied. 3,953,124, Cl. 355-75.000.
Komatsu, Koei; Nishiyama, Shigeyuki; Sakabe, Nobuyuki; and Kogure, Akira, to Japan Synthetic Rubber Co., Ltd. Process for producing conjugated diolefinic polymers. 3,953,409, Cl. 526-82.000.
Komiya, Yasuo: *See—*
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Konan Electric Co., Ltd.: *See—*
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Kondo, Asaji: *See—*
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Livesey, James Robert; and Griauzde, Felix, to Mattel, Inc. Launcher for a toy vehicle, including a shim for supporting the vehicle rear end. 3,952,442, Cl. 46-206.000.
Loc-Rite, Incorporated: *See—*
Kindl, George F., 3,952,877.
Locke, John W., to University of Toronto, The Governing Council of the. Method and apparatus for recording latent photographic images. 3,953,859, Cl. 346-1.000.
Lohmann Apparatebau GmbH: *See—*
Erfeling, Arthur, 3,952,703.
Lohr, Joseph B., to Litton Business Systems, Inc. Method for forming a print wheel with metal rim. 3,952,397, Cl. 29-421.00R.
Loisy, Claude Michel: *See—*
Balut, Jacques Albert Louis Georges; Lemaire, Pierre Eugene Gerard K.; and Loisy, Claude Michel, 3,953,137.
Lombardo, Virginia, to Lawrence Peska Associates, Inc., a part interest. Dish drainer. 3,952,875, Cl. 211-41.000.
Lonati, Francesco, to Costruzioni Meccaniche Lonati di Lonati Francesco & Figli (Ettore, Fausto, Tiberio) S.n.c. Cam ring. 3,952,548, Cl. 66-57.000.
Long, John W.; and Flora, Barney S., to Exxon Nuclear Company, Inc. Assembly mechanism for nuclear fuel bundles. 3,953,287, Cl. 176-78.000.
Long Manufacturing Co., Inc.: *See—*
Atkinson, Wallace E., 3,952,559.
Longyear Company: *See—*
Anderson, John Forrest, 3,952,817.
Loos, George J.: *See—*
Hauge, Robert Z.; Loos, George J.; and Marsicano, Matthew F., 3,953,039.
Lopke, Edward L.: *See—*
Davis, James L.; Lopke, Edward L.; and Pechous, Leslie Joseph, 3,952,502.
L'Oreal: *See—*
Bouillon, Claude; and Rosenbaum, Georges, 3,953,450.
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 3,953,508.
Vanlerberghe, Guy; and Sebag, Henri, 3,953,608.
Loring, Charles M., Jr.: *See—*
Wilson, Thomas L.; Loring, Charles M., Jr.; and Smith, Peter H., 3,952,421.
Lotte, Andre, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Doctor-blade holder with cleaning means. 3,952,650, Cl. 101-120.000.
Loughridge, Edward T., to Ashland Vault Incorporated. Diffuser for aeration systems. 3,953,554, Cl. 261-124.000.
Louis, Arnold S., to Litton Systems, Inc. Multi-wire wiper contact for potentiometers and other electromechanical devices and method for making same. 3,952,411, Cl. 29-630.00E.
Loveless, Stanely M., to General Gas Light Company. Electrically operated mini-valve. 3,952,774, Cl. 137-625.500.
Low, Miklos: *See—*
Kisfaludy, Lajos; Low, Miklos; Schon, Istvan; Szirtes, Tamas; Sarkozi, Maria Sz.; Bajusz, Sandor; Turan, Andrae; Beks, Rosa; Juhasz, Attila; Graf, Laszlo; Medzihradszky, Kalman; and Szporny, Laszlo, 3,953,415.
Lubrizol Corporation, The: *See—*
Farone, Eugene Richard, 3,953,395.
Habiby, Emile Najib, 3,953,347.
Lucan, Joseph L. Garden Tool. 3,952,812, Cl. 172-375.000.
Lucas Aerospace Limited: *See—*
Bottoms, Harry Simister, 3,953,160.
Luderer, Fred: *See—*
Raetz, Dieter; and Luderer, Fred, 3,952,951.
Ludwig, Lawrence P., to United States of America, National Aeronautics and Space Administration. Fluid seal for rotating shafts. 3,953,038, Cl. 277-93.00R.
Luich, Ronald Joseph: *See—*
Ferguson, Walter James; and Luich, Ronald Joseph, 3,952,598.
Luttgert, Hans; and Kohler, Werner, to Siemens Aktiengesellschaft. Contact system for a vacuum switch. 3,953,698, Cl. 200-279.000.
Lutz, David Edward. Vehicle loading and unloading apparatus. 3,952,887, Cl. 214-38.00C.
Lyman, Frank; and Lyman, Joseph, to Cambridge Thermionic Corporation. Rotor balancing apparatus and system. 3,952,602, Cl. 73-457.000.
Lyman, Joseph: *See—*
Lyman, Frank; and Lyman, Joseph, 3,952,602.
Lynch Corporation: *See—*
James, Richard L., 3,953,187.
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MacMillan, Francis S. Kilmer; and Lyness, Warren I., 3,953,599.
M & J Valve Company: *See—*
Ottenstein, Sidney Allan, 3,952,759.
M&T Chemicals Inc.: *See—*
Dworkin, Robert D.; and Ejk, Adam J., 3,953,385.
Ma, Hsiao J.; and Studtmann, George H., to Borg-Warner Corporation. External charging circuit for static switch. 3,953,786, Cl. 321-45.00C.
Maas, Douwe: *See—*
Korr, Heinrich; Maas, Douwe; and Telemann, Gerhard, 3,953,690.
Maas, Jurgen: *See—*
Nieschulz, Otto; Rudiger, Gunther; and Maas, Jurgen, 3,953,588.
Mac Manufacturing Company, Inc.: *See—*
Rogers, James H., 3,952,855.
Macbeth, Albert W., to Thiokol Corporation. Rocket motor construction. 3,952,506, Cl. 60-255.000.
MacGregor International, S. A.: *See—*
Leitch, George, 3,952,790.
Mack, Ronald H.: *See—*
Kobylarz, Lawrence P.; and Mack, Ronald H., 3,953,887.
Mackley-Ace Limited: *See—*
Kidd, Patrick Michael, 3,952,962.
MacMillan, Francis S. Kilmer; and Lyness, Warren I., to Procter & Gamble Company, The. Compositions for topical application to animal tissue and method of enhancing penetration thereof. 3,953,599, Cl. 424-265.000.
Madsen, Kristian Dahl, to Allmanna Svenska Elektriska Aktiebolaget. Method of securing the rotor winding of a turbo-generator rotor. 3,952,406, Cl. 29-598.000.
Maekawa, Tadashi: *See—*
Tabara, Yoshijiro; Akiyama, Hiroshi; Igawa, Masayuki; Maekawa, Tadashi; and Shinomiya, Tokuo, 3,953,282.
Maekawa, Yukio: *See—*
Imai, Shinichi; Fujita, Shinsaku; Maekawa, Yukio; and Sakanoue, Seiki, 3,953,211.
Magel, Theodore T.: *See—*
Hartline, Albert G., III; Campbell, John A.; and Magel, Theodore T., 3,953,194.
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Rock, Erich; and Mages, Bernhard, 3,952,366.

Magosch, Karl-Heinz: *See—*
Feinauer, Roland; Magosch, Karl-Heinz; and Ruter, Jorn, 3,953,405.

Magrath, Joseph M.: *See—*
Hansen, John Erik; Magrath, Joseph M.; and Hierath, Leonard L., 3,952,919.

Mahig, Laszlo, to Aluterv Aluminiumipari Tervezo Vallalat. Tank provided with pneumatic mixing pipe. 3,953,003, Cl. 259-4.00R.

Maillefer S.A.: *See—*
Veyrassat, Louis, 3,952,960.

Maillet, Edgard Jacques. Shredding unit for conditioning scrap metal parts having a maximum thickness of 5 millimeters. 3,952,957, Cl. 241-73.000.

Mailliet, Jean, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Double clamping rings. 3,952,375, Cl. 24-81.0PE.

Maines, Peter. Protective device for door knobs and the like. 3,952,564, Cl. 70-416.000.

Majus, Joseph. Vice mounted multiple-use band saw with detachable work surface. 3,952,622, Cl. 83-799.000.

Makarov, Alexei Mikhailovich: *See—*
Chepurnoi, Nikolai Prokhorovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; Tupitsyn, Sergei Konstantinovich; Nazarov, Nikolai Grigorievich; Plavskikh, Vladimir Dmitrievich; Tkach, Khaim Berkovich; Cherednikov, Evgeny Nikolaevich; Galbinshtein, Alexandr Nisovich; Borshtein, Mikhail Vladimirovich; Karavaev, Andron Trofimovich; Menzorov, Valery Anatolievich; and Makarov, Alexei Mikhailovich, 3,952,813.

Makino, Osamu: *See—*
Matsuura, Mikio; Makino, Osamu; Nishi, Nobuji; and Matsuoka, Michio, 3,953,373.

Malcolm, James A., to Flag Carton Corporation Ltd. Paperboard cartons with liquid-proof liners. 3,952,940, Cl. 229-14.0BA.

Malden Mills, Inc.: *See—*
Arden, Frederic R., 3,952,964.

Mallinckrodt, Inc.: *See—*
Monte, Alexander A.; and Chiang, Ching, 3,953,294.
Monte, Alexander A.; and Chiang, Ching, 3,953,295.
Wiegert, Philip E., 3,953,497.

Mameda, Noriyoshi: *See—*
Terayama, Susumu; and Mameda, Noriyoshi, 3,952,891.

Mandoval Vermiculite (Proprietary) Limited: *See—*
Preston, Ian; and Davidtz, John Charles, 3,953,357.

Manion, Francis M.: *See—*
Drzewiecki, Tadeusz M.; and Manion, Francis M., 3,952,576.

Mann, Adriaan B.; and Vermeulen, Jacobus J. C., to Stichting Waterbouwkundig Laboratorium. Self-equilibrating balance. 3,952,600, Cl. 73-433.000.

Mannara, Giuseppe, to Colgate-Palmolive Company. Apparatus for filling containers with composite fluent material. 3,952,782, Cl. 141-100.000.

Manoury, Philippe Michel Jacques: *See—*
Giudicelli, Don Pierre Rene Lucien; Najer, Henry; Iliesco-Branceni, Bogdan; Manoury, Philippe Michel Jacques; and Dumas, Andre Pierre Fernand, 3,953,449.

Manske, Warren C.; Bretl, Robert; and Dupont, Donald, to Bay Electric Company. Machine for cleaning and inspecting motion picture films. 3,952,591, Cl. 73-157.000.

Manufacture de Machines du Haut-Rhin-Manurhin S.A.: *See—*
Wesch, Ludwig, 3,953,629.

Manwaring, Joshua G. D., to Radio Frequency Co., Inc. Radio frequency heating and ventilating electrode system. 3,953,701, Cl. 219-10.810.

Maopolski, Bernard J., to Harris Corporation. Collating apparatus. 3,953,018, Cl. 270-55.000.

Marathon Manufacturing Company: *See—*
Marotto, Anthony F., 3,952,789.

Marchetti, John A.: *See—*
Nakamura, Tadao; Detwiler, Barry C.; and Marchetti, John A., 3,953,800.

Mares, Karel: *See—*
Junek, Jan; Ripka, Josef; Vobornik, Vaclav; Hortlik, Frantisek; Jaros, Frantisek; Elias, Jiri; Brynda, Vaclav; Mares, Karel; Kotrba, Zdenek; Lihtarova, Ludmila; Brozkova, Marie; and Rehackova, Bozena, 3,952,494.

Marion Laboratories, Inc.: *See—*
Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, 3,953,458.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 3,953,396, Cl. 260-45.80A.

Mark, Victor, to General Electric Company. Flame retardant polycarbonate composition. 3,953,399, Cl. 260-45.85H.

Markovac, Anica: *See—*
Ash, Arthur B.; La Montagne, Maurice P.; and Markovac, Anica, 3,953,463.

Marotto, Anthony F., to Marathon Manufacturing Company. Top position lock for venetian blinds. 3,952,789, Cl. 160-168.00R.

Marquis, Paul, to Societe Civile D'Etudes et de Recherches pour L'Obtention de Fibres Minerales (S.E.R.O.F.I.M.). Ply of parallel filaments. 3,953,641, Cl. 428-195.000.

Marrero, Louis. Convertible switch and outlet assembly. 3,953,689, Cl. 200-51.00R.

Mars, Inc.: *See—*
Fougere, Guy L.; and Jeffreys, Dennis C., 3,952,851.

Marsh, Harold E., Jr., to California Institute of Technology. Water-insoluble, swellable polyurethanes. 3,953,406, Cl. 260-77.5AM.

Marsicano, Matthew F.: *See—*
Hauge, Robert Z.; Loos, George J.; and Marsicano, Matthew F., 3,953,039.

Martera, Pierantonio: *See—*
Ginnasi, Alessandro; Vetere, Alessandro; and Martera, Pierantonio, 3,953,300.

Martignoni, Pasquale: *See—*
Duncan, William A.; Murfree, James A., Jr.; Martignoni, Pasquale; Wharton, Walter W.; and Phillips, John F., 3,953,262.

Martin, Fred David, to Calgon Corporation. Stabilization of polymer solutions. 3,953,341, Cl. 252-8.55D.

Martin, Fred David; and Guilbault, Lawrence James, to Calgon Corporation. Petroleum recovery process. 3,953,342, Cl. 252-8.55D.

Martin, Fred David: *See—*
Persinski, Leonard J.; Martin, Fred David; and Adams. Sally Lee, 3,952,805.

Martin Marietta Corporation: *See—*
Harris, Charles W.; Layton, Allen C.; and Howle, Robert E., 3,953,706.
Layton, Allen C.; Zinn, Werner G., Jr.; Mendez, Antonio J.; Howle, Robert E.; and Bayston, Thomas E., 3,953,667.

Martin, Vance B.; Allen, George D.; Haubein, Harold D.; Goe, Melvin B., Jr.; and Toeniskoetter, Kenneth A., to A. B. Chance Company. Externally bussed, encapsulated current limiting fuse for pad mounted transformers. 3,953,818, Cl. 337-191.000.

Martin, William D.: *See—*
Keller, Charles Robert; and Martin, William D., 3,952,999.

Martini, Angelo J.; and Gourley, Bruce R., to United States of America, Energy Research and Development Administration. Nickel-chromium-silicon brazing filler metal. 3,953,285, Cl. 176-66.000.

Maruko Seiyaku Co., Ltd.: *See—*
Fujimura, Hajime; Hori, Mikio; Ootani, Osamu; Ohno, Sachio; Kitamikado, Tadashi; Kato, Kiyoshi; and Nagasaka, Mitsuaki, 3,953,467.

Maruyama, Shoji; Kubota, Tomio; Kojima, Katue; Tamura, Hiroshi; and Harada, Masahide, to Ricoh Co., Ltd. Sensitizer for use in electrophotographic light-sensitive material. 3,953,433, Cl. 260-240.00D.

Maruzen Sewing Machine Co., Ltd.: *See—*
Dainin, Susumu, 3,953,089.

Marvin Glass & Associates: *See—*
Katzman, Allison W.; and Barlow, Gordon A., 3,953,027.
Terzian, Rouben T., 3,952,449.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Glass fiber reinforced elastomers. 3,953,648, Cl. 428-378.000.

Maschinenfabrik FAHR AG: *See—*
Stampfer, Michael; Graeber, Ewald; Oni, Helmut; and Ruede, Ernst, 3,952,828.

Masiello, Dominic J., to Masiello, Dominic Joseph; and Masiello, Louise A. Building structure formed of modular units with cantilevered portions for forming a corridor floor. 3,952,465, Cl. 52-73.000.

Masiello, Dominic Joseph: *See—*
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Masiello, Louise A.: *See—*
Masiello, Dominic J., 3,952,465.

Massachusetts Institute of Technology: *See—*
O'Connor-d'Arlach, Jorge; and Fonstad, Clifton G., Jr., 3,953,879.

Massey-Ferguson Services N.V.: *See—*
Quick, Donald Jonathon, 3,952,482.

Masterson, Dean H. Trimmer with laterally positioned blade and separately adjustable front and rear wheels. 3,952,483, Cl. 56-17.200.

Maston, John F. Padlock clasp. 3,953,062, Cl. 292-57.000.

Masuoka, Michio: *See—*
Hiraga, Kentaro; Yoshioka, Kouichi; Goto, Giichi; Nakayama, Ryo; and Masuoka, Michio, 3,953,483.

Matburn (Holdings) Limited: *See—*
Sansom, Michael, 3,952,869.

Materials Research Corporation: *See—*
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Mathis, Joseph D., to Western Electric Company, Inc. Plug-in terminal. 3,953,103, Cl. 339-276.00T.

Mathison, Ian William; Solomons, William Ebenezer; and Jones, Raymond Henry, to Marion Laboratories, Inc. 1-Substituted amino-2-alkyl-5-hydroxy-7,8-cyclopentano[h]-1,2,3,4-tetrahydroisoquinolines. 3,953,458, Cl. 260-288.0CF.

Matolcsy, Gyorgy; and Bordas, Barna, to Eszakmagyarorszagi Vegyimuvek. Process for the preparation of substituted S-alkyl thiocarbamates. 3,953,427, Cl. 260-239.0BF.

Matschinsky, Wolfgang, to Bayerische Motoren Werke Aktiengesellschaft. Rigid rear axle for motor vehicles. 3,952,824, Cl. 180-73.00D.

Matsubara, Kiyoshi, to Agency of Industrial Science & Technology. Method for ionization electrostatic plating. 3,953,619, Cl. 427-39.000.

Matsuda, Shunsuke: *See—*
Hasegawa, Katsue; Sano, Reiji; Askawa, Shirow; and Matsuda, Shunsuke, 3,953,210.

Matsuda, Yujiro; and Nakamura, Kazuchika, to Kawashima Orimono Co., Ltd. Process for the production of artificial leather having a crepe pattern. 3,953,271, Cl. 156-85.000.

Matsumoto, Kunio, to Copal Company Limited. Electric shutter. 3,953,865, Cl. 354-29.000.

Matsumoto, Seiichi: *See—*
Hosoe, Kazuya; Aizawa, Hiroshi; Matsumoto, Seiichi; and Yokota, Hideo, 3,953,729.

Matsumura, Masaji: *See—*
Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; Sakai, Jiro; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,952,944.

Matsuno, Takashi: *See—*
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Matsuoka, Michio: *See—*
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Matsushita Electric Industrial Company, Ltd.: *See—*
Arimura, Ichiro; Taniguchi, Hiroshi; and Sekimoto, Kunio, 3,953,882.
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Matsuura, Toshiro; and Takeda, Minoru, 3,953,760.
Nakamura, Tadao; Detwiler, Barry C.; and Marchetti, John A., 3,953,800.
Nishioka, Matsuo; Takeyoshi, Yasuo; and Oka, Shunzo, 3,953,820.
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Matsushita Electric, Wireless Research Laboratory: *See—*
Tsunashima, Eiichi, 3,953,664.

Matsuura, Mikio; Makino, Osamu; Nishi, Nobuji; and Matsuoka, Michio, to Matsushita Electric Industrial Co., Ltd. Voltage-dependent resistor. 3,953,373, Cl. 252-518.000.

Matsuura, Toshiro; and Takeda, Minoru, to Matsushita Electric Industrial Co., Ltd. Dynamic electron beam convergence apparatus. 3,953,760, Cl. 315-13.00C.

Mattel, Inc.: *See—*
Livesey, James Robert; and Griauzde, Felix, 3,952,442.
Roitz, Nicholas Joseph; and Steinberg, Harold Eugene, 3,953,104.

Matthews, Walter Sidney, III: *See—*
Meyers, Cal Yale; and Matthews, Walter Sidney, III, 3,953,494.

Matunami, Mituo, to Sharp Kabushiki Kaisha. Beam lead formation method. 3,952,404, Cl. 29-589.000.

Matusch, Siegfried: *See—*
Dietzel, Walter; and Matusch, Siegfried, 3,953,224.

Mauzin, Andre E.; Truffart, Pierre P.; and Tharel, Ferdinand L. Snubbed railway vehicle bogie. 3,952,669, Cl. 105-171.000.

Mawhinney, Daniel David; and Walsh, Thomas Edward, to RCA Corporation. Constant temperature control for transferred electron devices. 3,953,878, Cl. 357-81.000.

May & Baker Limited: *See—*
Gallant, John Henry; and Johnson, Michael Robert Thomas, 3,953,803.

May, John E., to General Electric Company. Controlled grain size metal oxide varistor and process for making. 3,953,371, Cl. 252-512.000.

May, Max, to Sandoz Ltd. Improvements in or relating to organic compounds. 3,953,163, Cl. 8-94.260.

Mayr, Hubert: *See—*
Schonbeck, Rupert; Kloimstein, Engelbert; Diskus, Alfred; Auer, Engelbert; and Mayr, Hubert, 3,953,445.

Mazman, Martin S. Muscle building exercise device. 3,953,025, Cl. 272-132.000.

McAlarney, Fred R., to Pantasote Company, The. Sealing gasket. 3,952,455, Cl. 49-497.000.

McBride, Michael Eudell: *See—*
Greek, John Charlie, Jr.; McBride, Michael Eudell; and Tanner, Howard Carl, 3,952,852.

McCauley, Roger A., to Rexar Industries, Inc. Fuel conservation means for internal combustion engines and the like. 3,952,716, Cl. 123-141.000.

McClusky, James K.: *See—*
Wilhelm, Harley A.; and McClusky, James K., 3,953,556.

McCord, William F. Disposable tooth cleaning apparatus. 3,952,867, Cl. 206-229.000.

McCorkel, Franklin M., to Aggregates Equipment, Inc. Ribbon flight conveyor formed of welded chain links. 3,952,862, Cl. 198-213.000.

McCormick, Robert L.: *See—*
Stark, Allan P., 3,953,055.

McCrae, Robert C.: *See—*
Lira, Emil P.; Barker, Walter M.; and McCrae, Robert C., 3,953,597.

McDonald, Ean Lawrence. Marine signalling device. 3,952,694, Cl. 116-124.00B.

McDonnell Douglas Corporation: *See—*
Fisher, Ralph W.; Licis, George; and Schurter, Wayne W., 3,953,111.
Painter, James H., 3,953,705.

McElroy, Arthur H.: *See—*
Carroll, James C.; and McElroy, Arthur H., 3,953,059.

McFarland, Donald L., to Fairfield Marking Products, Inc. Stamp device. 3,952,653, Cl. 101-327.000.

McGovern, Terrence P.: *See—*
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McGowan, Joseph: *See—*
Carter, John L.; and McGowan, Joseph, 3,953,853.

McHenry, Warren B. Gate latch. 3,953,064, Cl. 292-184.000.

McKee, Fount E., to Delta-X Corporation. Control circuit for shutting off the electrical power to a liquid well pump. 3,953,777, Cl. 318-474.000.

McKinstry, Richard Bruce; and Godbout, Joseph Charles, to Data General Corporation. Tape transport system. 3,952,968, Cl. 242-182.000.

McMahan, W. Glenn, to Raymond Lee Organization,. Inc., The, a part interest. Temperature registering faucet attachment. 3,952,594, Cl. 73-349.000.

McMillan, William D.: *See—*
Habiger, Cyril W.; McMillan, William D.; Persson, David L.; and Ferre, Glenn E., deceased, 3,952,515.

McRobert, Leon R., to FMC Corporation. Adjustable hedger. 3,952,485, Cl. 56-235.000.

Mead, Kenneth W.: *See—*
Graham, Joe D.; Mead, Kenneth W.; and Babb, Henry Edgar, 3,952,582.

Means, William A., to Applied Motors, Inc. Voltage converter system with on-off control. 3,953,782, Cl. 321-28.000.

Medevice Company, The: *See—*
Lipfert, Donald E.; Romney, Seymour L.; Zeidman, Robert; and Goldschmidt, Willfred, 3,952,737.

Medzihradszky, Kalman: *See—*
Kisfaludy, Lajos; Low, Miklos; Schon, Istvan; Szirtes, Tamas; Sarkozi, Maria Sz.; Bajusz, Sandor; Turan, Andrae; Beks, Rosa; Juhasz, Attila; Graf, Laszlo; Medzihradszky, Kalman; and Szporny, Laszlo, 3,953,415.

Meguerian, Garbis H.; and Kaneko, Yasuo, to Standard Oil Company; and Mitsubishi Motors Corporation. Maximizing conversion of nitrogen oxides in the treatment of combustion exhaust gases. 3,953,576, Cl. 423-213.700.

Meijer, Frans: *See—*
Poolman, Petrus Jacobus; and Meijer, Frans, 3,952,595.

Melville, Thomas. Protective eye shade for sportsmen. 3,952,331, Cl. 2-14.00H.

Mendell, Lester W., Jr. Holding means. 3,953,014, Cl. 269-43.000.

Mendez, Antonio J.: *See—*
Layton, Allen C.; Zinn, Werner G., Jr.; Mendez, Antonio J.; Howle, Robert E.; and Bayston, Thomas E., 3,953,667.

Mendez, John. Spare tire hoist. 3,952,894, Cl. 214-451.000.

Mendez, Tomas; and Van Cleve, Guy, Jr., to Gulf Oil Corporation. Recovery of hexane from recycle streams from ethylene polymerization reactors. 3,953,301, Cl. 203-75.000.

Mengeringhausen, Max, to Mero AG. Composite structural panel and process of making. 3,952,402, Cl. 29-527.100.

Menzorov, Valery Anatolievich: *See—*
Chepurnoi, Nikolai Prokhorovich; Kostylev, Alexandr Dmitrievich; Gurkov, Konstantin Stepanovich; Tupitsyn, Konstantin Konstantinovich; Tupitsyn, Sergei Konstantinovich; Nazarov, Nikolai Grigorievich; Plavskikh, Vladimir Dmitrievich; Tkach, Khaim Berkovich; Cherednikov, Evgeny Nikolaevich; Galbinshtein, Alexandr Nisovich; Borshtein, Mikhail Vladimirovich; Karavaev, Andron Trofimovich; Menzorov, Valery Anatolievich; and Makarov, Alexei Mikhailovich, 3,952,813.

Merck & Co., Inc.: *See—*
Bolhofer, William A., 3,953,465.
Cragoe, Edward J., Jr.; and Woltersdorf, Otto W., Jr., 3,953,476.
Czaja, Robert F.; Pines, Seemon H.; and Abramson, Newton L., 3,953,520.
Mrozik, Helmut H., 3,953,492.
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Nieschulz, Otto; Rudiger, Gunther; and Maas, Jurgen, 3,953,588.
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Meredith, Ronald D.; and Shoberg, John T. Portable fluorescent lamp and inverter therefor. 3,953,768, Cl. 317-31.000.

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Negley, Marvin C., to Lisle Corporation. Drill grinder. 3,952,459, Cl. 51-219.00R.
Nelson, Alfred Dwayne; and Goken, Garold L., to Minnesota Mining and Manufacturing Company. Adhesively bonded rail joint. 3,952,948, Cl. 238-243.000.
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Nims, Jerry Curtis: *See—*
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Nolan, John L., to Hollister Incorporated. Vent device for ostomy appliance. 3,952,727, Cl. 128-283.000.
Nolan, John T., Jr.; and Wilson, Raymond F., to Texaco Inc. Noncatalytic process for treating naphtha containing olefinically unsaturated components. 3,953,322, Cl. 208-255.000.
Nolan, John T., Jr.; and Wilson, Raymond F., to Texaco Inc. Process for reduction of olefinic unsaturation of pyrolysis naphtha (dripolene). 3,953,323, Cl. 208-255.000.
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Noorily, Peter, to Thomas & Betts Corporation. Cable bundling strap. 3,952,373, Cl. 24-16.0PB.
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Obenchain, Richard F. Process for the direct reduction of metal oxides. 3,953,196, Cl. 75-38.000.
Obetz, James E.; and Tarini, Albert R., to Diamond Shamrock Corporation. Coning oil. 3,953,339, Cl. 252-8.900.
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Ohara, Takashi; Ono, Tetsuji; Ichihara, Shoichi; and Saito, Koichi, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Method for the production of a platinum catalyst used for purification of exhaust and waste gases. 3,953,369, Cl. 252-472.000.
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Okado, Yosuke; Fujikawa, Hiroshi; and Takusagawa, Takashi, to Bridgestone Tire Company Limited. Puncture-sealing rubber composition. 3,952,787, Cl. 152-347.000.
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Oppici, Ernesto, to Gruppo Lepetit S.p.A. Process for preparing α-aminoalcohols. 3,953,513, Cl. 260-585.00C.

Orban, Ivan; Lind, Hanns; Brunetti, Heimo; and Rody, Jean, to Ciba-Geigy Corporation. Process for the preparation of 2,2,6,6-tetramethyl-4-oxopiperidine. 3,953,459, Cl. 260-293.890.

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Oron, Moshe; and Paiss, Yehuda, to University of Rochester, The. Dynamic mass spectrometer. 3,953,732, Cl. 250-287.000.

Orzechowski, Casimir T.; and Seiden, Nat, to United States of America, Navy. Means for improving rocket missile accuracy. 3,952,970, Cl. 244-3.230.

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Oshida, Otto A.; Gilmour, John B.; and Siddiqui, Nadeem U., to Grefco, Inc. Mineral aggregate (perlite) acoustical board. 3,952,830, Cl. 181-33.00G.

Oshima, Takeo, to Glory Kogyo Kabushiki Kaisha. Sheet counter. 3,953,022, Cl. 271-95.000.

Osten, John H.; Ruffalo, Peter D.; and Johnson, Donald L., to J. I. Case Company. Transmission park-lock mechanism. 3,952,838, Cl. 188-31.000.

Osugi, Yoshiyuki: *See—*
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O'Sullivan, Bernard. Shoe stretching device. 3,952,357, Cl. 12-115.200.

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Ott, Eduard Karl, to Frontier Machinery Company. Alignment control apparatus for center pivot irrigation equipment. 3,952,769, Cl. 137-344.000.

Ottenstein, Sidney Allan, to M & J Valve Company. Liquid line break control system and method. 3,952,759, Cl. 137-12.000.

Otto Sick KG, Metallwarenfabrik, Firma: *See—*
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Ouchi, Teruo, to Olympus Optical Company, Ltd. Apparatus for adjusting the light source position of a light source assembly. 3,953,724, Cl. 240-44.200.

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Owen, Trevor Wynne, to Owen Tri-Cut Limited. Mail processing equipment. 3,952,874, Cl. 209-73.000.

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Palecek, Vincent James, to Bunker Ramo Corporation. Electrical connector assemblies. 3,953,101, Cl. 339-174.000.

Paletta, Benno: *See—*
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Palmcrantz, Jan Birger, to Hiab-Foco Aktiebolag. Support legs of mobile cranes. 3,953,052, Cl. 280-763.000.

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Pampuch, Klaus; and Wanke, Gunter. Container for tubular glass equipment. 3,952,873, Cl. 206-528.000.

Pankin International, Ltd.: *See—*
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Pankin, Jerome; and Feldman, Beverly Ann, to Pankin International, Ltd. Shoe construction. 3,952,430, Cl. 36-51.000.

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Pantusco, Anthony A.; Pinckney, Warren J.; Santillo, George R., Jr.; and Scharff, Gerard J., to International Business Machines Corporation. Method and system for growing monocrystalline ingots. 3,953,281, Cl. 156-618.000.

Papst Motoren KG: *See—*
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Pardoe, Carroll T.: *See—*
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Parker, Denny S., to Central Contra Costa Sanitary District. Sewage treatment process. 3,953,327, Cl. 210-7.000.

Parker, Earl E.: *See—*
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Parr, Edward L.: *See—*
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Parsons, Hubert J.; and Sherwood, Charles D., to Hardinge Brothers, Inc. Machine tool dial assembly. 3,952,693, Cl. 116-115.500.

Partlow, Jackson A., to Zip-Up Lighting Tower Company, Inc. Extendible tower structure. 3,952,467, Cl. 52-121.000.

Pas, Frank Bruno: *See—*
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Paskert, Joseph H., to Eaton Corporation. Fastener and joint formed therewith. 3,952,475, Cl. 52-758.00F.

Patarcity, Adam J.; and Smith, Daniel J., to Thiokol Corporation. Portable conversion and dispensing apparatus for curable elastomeric compounds. 3,953,006, Cl. 259-191.000.

Patel, Jagdish, to Palmer Instruments, Inc. Universal mounting for bimetallic thermometer. 3,952,596, Cl. 73-363.900.

Patterson, Terence Neil: *See—*
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Patthey, Michel, to Edouard Dubied et Cie (Societe Anonyme). Apparatus for swaging the movement control belts for controlling operating groups of a knitting machine. 3,952,943, Cl. 234-116.000.

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Pechman, Alexander: *See—*
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Pechous, Leslie Joseph: *See—*
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Pedrazzi, Reinhard, to Sandoz Ltd. Salts of stilbene-azo and stilbene-azoxy dyes and process for their preparation. 3,953,419, Cl. 260-143.000.

Peetermans, Julien, to Recherche et Industrie Therapeutiques (R.I.T.). Live influenza virus vaccines and preparation thereof. 3,953,592, Cl. 424-89.000.

Pei, Yu K., to Owens-Illinois, Inc. Solar energy converter. 3,952,724, Cl. 126-271.000.

Peltz, John Robert; and Szeverenyi, Nikolaus A., to GTE Sylvania Incorporated. Fluid pressure sensor device. 3,952,691, Cl. 116-65.000.
Pensack, Joseph Michael: *See—*
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Pepperman, Armand B., Jr.; Daigle, Donald J.; and Vail, Sidney L., to United States of America, Agriculture. Flame resistant organic textiles through treatment with phenols and adduct polymers. 3,953,166, Cl. 8-116.00P.
Peritel, Peripheriques de Telephone (S.A.R.L.): *See—*
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Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, to Calgon Corporation. Well cementing method using a composition having improved flow properties, containing sulfonated copolymers of styrene-maleic anhydride. 3,952,805, Cl. 166-293.000.
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Peterson, Richard H. Electronic tuning device. 3,952,625, Cl. 84-454.000.
Peterson, Wayne A., to Caterpillar Tractor Co. Flow sensing and control apparatus. 3,952,510, Cl. 60-403.000.
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Phillips, Stanley J., to Warner-Lambert Company. Automatic dispenser for periodically actuating an aerosol container. 3,952,916, Cl. 222-70.000.
Phillips, Stewart A. Automatic material feeding apparatus. 3,952,883, Cl. 214-8.50K.
Phone-Mate: *See—*
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Photo Systems, Inc.: *See—*
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Pichl, Heinz. Shaft protecting and propeller mounting sheath. 3,952,686, Cl. 115-17.000.
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Pickett, M. Frank: *See—*
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Pocrnja, Anton; and Wenzel, Heribert, to Linde Aktiengesellschaft. Apparatus for defogging a roadway, landing strip or the like. 3,952,950, Cl. 239-14.000.
Podesva, Ctirad; Scott, William T.; and Henson, David W., to Delmar Chemicals Limited. Piperazino-anilido compounds. 3,953,448, Cl. 260-268.0BZ.
Podlesnykh, Petr Ivanovich: *See—*
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Podowski, Robert R., to Zenith Radio Corporation. Receiver digital control system. 3,953,801, Cl. 325-464.000.

Poitras, Edward J.; and Wlodyka, Edwin W., to Highland Laboratories. Fluid dispenser apparatus. 3,952,918, Cl. 222-82.000.

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Polaroid Corporation: *See—*
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Polska Akademia Nauk Instytut Chemii Organicznej: *See—*
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Polysius AG: *See—*
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Potter, Ralph A.; and Tennery, Victor J., to United States of America, Energy Research and Development Administration. Preparation of uranium nitride. 3,953,355, Cl. 252-301.10R.

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Presto Lock Company: *See—*
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Price, David D. Storage rack for papers. 3,952,876, Cl. 211-50.000.

Prince, Paul R., to Hughes Aircraft Company. Adaptive video centroid tracker. 3,953,670, Cl. 178-6.800.

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Procter & Gamble Company, The: *See—*
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Pyzel, Ewald D.; and Codding, Harold E., to Ski Safe Inc. Touring ski boot heel binding. 3,953,042, Cl. 280-631.000.

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Queen, David Stewart; Bell, Peter William; Dick, Thomas Hutcheson; and Edgar, John Black, to Sidlaw Industries Limited. Method of making composite fabric. 3,953,269, Cl. 156-79.000.

Quick, Donald Jonathon, to Massey-Ferguson Services N.V. Butt lifting roller for sugar cane harvesters. 3,952,482, Cl. 56-13.900.

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Rank Organisation Ltd., The: *See—*
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Rausing, Ruben A. Packing container intended in particular for pressurized contents. 3,952,900, Cl. 215-232.000.

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Reed, Dale H.; and Franklin, Alpheus A., to Atlantic Richfield Company. Method and apparatus for generating pressure waves in water by implosion. 3,952,833, Cl. 181-118.000.

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Regan Offshore International, Inc.: *See—*
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Regehr, Ulrich. Apparatus for separating material particles from gases. 3,953,183, Cl. 55-440.000.

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Mailliet, Jean, 3,952,375.

Rehackova, Bozena: *See—*
Junek, Jan; Ripka, Josef; Vobornik, Vaclav; Hortlik, Frantisek; Jaros, Frantisek; Elias, Jiri; Brynda, Vaclav; Mares, Karel; Kotrba, Zdenek; Lihtarova, Ludmila; Brozkova, Marie; and Rehackova, Bozena, 3,952,494.

Reichart, Louis W., Jr., to Xerox Corporation. Articulated development apparatus. 3,953,121, Cl. 355-3.0DD.

Reichel, Pavel: *See—*
Voboril, Bohuslav; Reichel, Pavel; and Kafunek, Pavel, 3,952,797.

Reichert, Donald G., to ABC Packaging Machine Corporation. Case erector. 3,952,636, Cl. 93-53.0SD.

Reimann, Christian; Weber, Hugo; and Ueth, Ewald, to J. & J. Marquardt. Actuator construction having releasable lock in actuated and deactuated positions. 3,953,696, Cl. 200-157.000.

Reimann, Hans. Oxygen aeration system for contaminated liquids. 3,953,326, Cl. 210-7.000.

Reinitz, Willard O., to Safetran Systems Corporation. Cantilever arm signal assembly. 3,952,978, Cl. 246-477.000.

Reisman, Emeric. Watch cases, dials and bezels. 3,952,499, Cl. 58-88.00R.

Remond, Jean-Pierre; Vitat, Jean-Claude; and Thebault, Jean-Robert, to Rhone-Progil. Composition containing diamide and halocarbon for treatment of surfaces. 3,953,381, Cl. 252-544.000.

Renold Limited: *See—*
Brownhill, Edward Joseph; Heaton, Roy; and Booth, Ralph, 3,952,849.

Rexar Industries, Inc.: *See—*
McCauley, Roger A., 3,952,716.

Reymond, Jean-Claude: *See—*
d'Auria, Luigi; Puech, Claude; and Reymond, Jean-Claude, 3,953,727.

Reynolds, William Albert, Jr.: *See—*
Hu, Hung Liang; Reynolds, William Albert, Jr.; and Rosier, Laurence Lee, 3,953,842.

Rezabek, Karel: *See—*
Zikan, Viktor; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, 3,953,454.

Rheinmetall GmbH: *See—*
Kaltmann, Hans-Joachim, 3,952,657.

Rhemrev, Pieter Eduard Reinier: *See—*
Van Os, Willem Arthur Adriann Algernon; and Rhemrev, Pieter Eduard Reinier, 3,952,734.

Rhodes, William A. Oscillatory saw. 3,952,412, Cl. 30-166.00R.

Rhone-Poulenc, S.A.: *See—*
Bost, Pierre; Constantini, Michel; Jouffret, Michel; and Lartigau, Guy, 3,953,527.
Brun, Robert; and Pages, Michel, 3,953,334.

Rhone-Poulenc-Textile: *See—*
Joly, Jean; and Sangalli, Silvio, 3,952,386.

Rhone-Progil: *See—*
Remond, Jean-Pierre; Vitat, Jean-Claude; and Thebault, Jean-Robert, 3,953,381.

Rice, Edward K. Method of assembling building structures. 3,952,474, Cl. 52-747.000.

Rice, Lyman A., to Armor Elevator Company. Signaling system for an elevator. 3,952,837, Cl. 187-29.00R.

Rich, Dennis E. Grinder apparatus for wheat, grains, and the like. 3,952,958, Cl. 241-162.000.

Richard Heinze, Firma: *See—*
Schnelle, Manfred; Zernig, Ernst; and Wilke, Jurgen, 3,952,367.

Richard Marine Limited: *See—*
Ingham, Michael J., 3,952,682.

Richards, Louis R.; and Sandberg, Kenneth F., to Formax, Inc. Vacuum sheet applicator. 3,952,478, Cl. 53-122.000.

Richardson, Edward Gregory, to National Research Development Corporation. Fire protection systems. 3,952,808, Cl. 169-61.000.

Richardson, Edwin A.: *See—*
Templeton, Charles C.; Street, Evan H., Jr; and Richardson, Edwin A., 3,953,340.

Richardson-Merrell Inc.: *See—*
Meyer, Donald R.; and Sill, Arthur D., 3,953,455.
Shemano, Irving, 3,953,602.

Richt, O. Hubert. Transport system for magnetic tape recorder and reproducer sets, particularly for cassette magnetic tape recorders. 3,952,932, Cl. 226-49.000.

Richter Gedeon Vegyeszeti Gyar Rt: *See—*
Kisfaludy, Lajos; Low, Miklos; Schon, Istvan; Szirtes, Tamas; Sarkozi, Maria Sz.; Bajusz, Sandor; Turan, Andrae; Beks, Rosa; Juhasz, Attila; Graf, Laszlo; Medzihradszky, Kalman; and Szporny, Laszlo, 3,953,415.

Richter, Sidney B.; and Kyker, Glendon D., to Velsicol Chemical Corporation. N-(halobenzoyl)-3,4-dibromohexahydrophthalimides. 3,953,397, Cl. 260-45.75B.

Ricoh Co., Ltd.: *See—*
Maruyama, Shoji; Kubota, Tomio; Kojima, Katue; Tamura, Hiroshi; and Harada, Masahide, 3,953,433.

Riddel, John W., to General Motors Corporation. Orbital vane rotary machine. 3,952,709, Cl. 123-8.310.

Rigg, Carl Fredrik: *See—*
Astrauskas, Peter John; Blondin, Guy Michel; Picard, Roland; and Rigg, Carl Fredrik, 3,953,582.

Rigoli, Mario. Apparatus for quick freezing of aqueous solutions or suspensions to be submitted to lyophilization. 3,952,541, Cl. 62-381.000.

Ring, Thomas F., to P. R. Mallory & Co. Inc. Variable speed drive means. 3,952,607, Cl. 74-393.000.

Ringe, Werner: *See—*
Rudszinat, Willy; Schwenke, Dieter; and Ringe, Werner, 3,952,865.

Ripka, Josef: *See—*
Junek, Jan; Ripka, Josef; Vobornik, Vaclav; Hortlik, Frantisek; Jaros, Frantisek; Elias, Jiri; Brynda, Vaclav; Mares, Karel; Kotrba, Zdenek; Lihtarova, Ludmila; Brozkova, Marie; and Rehackova, Bozena, 3,952,494.

Rivetta, Gianfranco; and Castracani, Guido, to Societa Italiana Telecommunicazioni Siemens S.p.A. Terminal clip for micromodule. 3,953,102, Cl. 339-258.00R.

Rizzo, Rudolph R.; and Julian, Gabriel L., to Flexicade Ltd. Highway barricade. 3,952,690, Cl. 116-63.00P.

RMC Research Corporation: *See—*
Michelsen, Paul F., 3,953,132.

Robert Bosch GmbH: *See—*
Knapp, Heinrich; and Jaggle, Gunther, 3,953,548.
Weyer, Herbert, 3,952,714.

Roberts, Alvin V., to Bookwrights, Inc. Bookbinding with plastic covers. 3,953,056, Cl. 281-29.000.

Roberts Company: *See—*
Petty, Robert H., 3,952,495.

Roberts, David B., Jr. Persistence test apparatus. 3,952,422, Cl. 35-22.00R.

Roberts, David E.; and Wind, Robert H., to General Motors Corporation. Dual rate valve assembly. 3,952,993, Cl. 251-20.000.

Roberts, Raymond J., to Consarc Corporation. Method and apparatus for casting a plurality of ingots. 3,952,792, Cl. 164-52.000.

Roberts, William Gary; and Burns, Robert, to Triplex Safety Glass Company Limited. Laminated transparent assemblies. 3,953,630, Cl. 428-38.000.

Robertshaw Controls Company: *See—*
Caldwell, Edward N., 3,952,760.
Cumming, Edward P., 3,952,611.

Robinson, Graham: *See—*
Jones, Ivor Wynn; Miles, Lyndon James; and Robinson, Graham, 3,953,227.

Robinson, Jack Randall; and Hilton, Roger T., to General Tire & Rubber Company, The. Apparatus for handling and spinning tires at a trimming station. 3,952,892, Cl. 214-340.000.

Robinson, Leonard W., to Woodall Industries Inc. Resin impregnated mats and method of making the same. 3,953,632, Cl. 428-95.000.

Robinson, William Henry, to New Zealand Inventions Development Authority. Torsional extrusion energy absorber or extrusion torque limiter. 3,953,012, Cl. 267-154.000.

Rocha, Dominica R. Cord reel and writing pad attachment for telephones. 3,953,688, Cl. 179-147.000.

Rock, Erich; and Mages, Bernhard, to Blum Gesellschaft m.b.H. Hinge device. 3,952,366, Cl. 16-129.000.

Rockefeller, Winston G., to Colgate-Palmolive Company. Dispensing container manufacturing apparatus and methods. 3,952,676, Cl. 113-1.00B.

Rockwell International Corporation: *See—*
Volpe, Richard L., 3,952,778.

Rodgard Manufacturing Co., Inc.: *See—*
Winfield, Mason C., Jr., 3,953,037.

Rody, Jean: *See—*
Orban, Ivan; Lind, Hanns; Brunetti, Heimo; and Rody, Jean, 3,953,459.

Roeder, George K. Pump plunger. 3,953,155, Cl. 417-554.000.

Rogers, James H., to Mac Manufacturing Company, Inc. High speed bottle transfer machine. 3,952,855, Cl. 198-32.000.

Roitz, Nicholas Joseph; and Steinberg, Harold Eugene, to Mattel, Inc. Camera viewer toy. 3,953,104, Cl. 350-4.000.

Rokop Corporation: *See—*
Rokop, Joseph; and Hughes, Geoffrey W., 3,953,005.

Rokop, Joseph; and Hughes, Geoffrey W., to Rokop Corporation. Apparatus for cutting continuously cast metal strands into billets. 3,953,005, Cl. 266-50.000.

Roller Bearing Company of America: *See—*
Koch, Hans W., 3,953,141.

Rollins, Paul Ferdinand; and Chamberlain, Christopher John, to Bowater Packaging Limited. Carton blank forming apparatus. 3,952,634, Cl. 93-49.00R.

Rolls-Royce (1971) Limited: *See—*
Fox, Roger Geoffrey; and Cox, Vernon Frederick, 3,952,503.

Roman, Paul: *See—*
Henry, Guy; Roman, Paul; and Tetevuide, Claude, 3,953,730.

Romberg, Hendrik: *See—*
Buurman, Herman; and Romberg, Hendrik, 3,953,189.

Romney, Seymour L.: *See—*
Lipfert, Donald E.; Romney, Seymour L.; Zeidman, Robert; and Goldschmidt, Willfred, 3,952,737.

Roos, Bryan K.: *See—*
Kaliher, Paul L.; Nelson, Fred W.; and Roos, Bryan K., 3,952,748.

Rosati, Vincent J., to United States of America, Army. Apparatus and method for the remote detection of vibrations of diffuse surfaces. 3,952,583, Cl. 73-71.300.

Rosemount Engineering Company Limited: *See—*
Johnston, James Stewart; and Cope, Dennis George, 3,953,721.

Rosen, Marvin: *See—*
Turnbo, Roy G.; Walker, David G.; and Rosen, Marvin, 3,953,627.

Rosenbaum, Georges: *See—*
Bouillon, Claude; and Rosenbaum, Georges, 3,953,450.

Rosenthal, Rudolph, to Atlantic Richfield Company. Synthesis of hydroquinone. 3,953,526, Cl. 260-621.00H.

Rosier, Laurence Lee: *See—*
Hu, Hung Liang; Reynolds, William Albert, Jr.; and Rosier, Laurence Lee, 3,953,842.

Rosseau, Richard B., to FMC Corporation. Brush strip for rotary coiled broom. 3,952,359, Cl. 15-182.000.

Roth, Johann; and Flandorfer, Robert, to Braun Aktiengesellschaft. Exposure meter for photographic cameras. 3,953,116, Cl. 352-141.000.

Roth, Thomas P. Collection medium for air sampler. 3,953,182, Cl. 55-270.000.

Roth, Walter L.; and Farrington, Gregory C., to General Electric Company. Sealed lithium-reducible sulfur oxyhalide cell. 3,953,228, Cl. 136-6.0FS.

Roth, Walter L.; and Farrington, Gregory C., to General Electric Company. Sealed lithium-reducible phosphorous oxyhalide cell. 3,953,229, Cl. 136-6.0FS.

Roth, Walter L.; and Farrington, Gregory C., to General Electric Company. Sealed lithium-reducible metal salt cell. 3,953,232, Cl. 136-6.0LN.

Roth, Walter L.; and Farrington, Gregory C., to General Electric Company. Sealed lithium-sulfur monochloride cell. 3,953,233, Cl. 136-6.0FS.

Roth, Walter L.: *See—*
Farrington, Gregory C.; and Roth, Walter L., 3,953,230.
Farrington, Gregory C.; and Roth, Walter L., 3,953,231.

Rottier, Marcel Rene; and Bienvenu, Jacques Michel Jean, to Compagnie Honeywell Bull (Societe Anonyme). Test and diagnosis device. 3,953,717, Cl. 235-153.0AK.

Rowe International, Inc.: *See—*
Pitel, Irving; Silverman, Richard S.; and Mueller, Richard J., 3,952,915.

Roze, Alberts: *See—*
Fencl, Vernon; and Roze, Alberts, 3,952,630.

Rozema, Arthur L.: *See—*
Kelver, William L.; Stuckey, Ronald L.; and Rozema, Arthur L., 3,953,821.

Rozner, Allan, to C.J.I. Industries, Inc. Auxiliary yarn dyeing mechanism. 3,952,552, Cl. 66-125.00A.

Rudiger, Gunther: *See—*
Nieschulz, Otto; Rudiger, Gunther; and Maas, Jurgen, 3,953,588.

Rudine, Kenneth M.: *See—*
Felter, John V.; Bond, John A.; and Rudine, Kenneth M., 3,952,638.

Rudszinat, Willy; Schwenke, Dieter; and Ringe, Werner, to Hauni-Werke Korber & Co., KG. Transfer apparatus for cigarettes or the like. 3,952,865, Cl. 198-240.000.

Ruede, Ernst: *See—*
Stampfer, Michael; Graeber, Ewald; Oni, Helmut; and Ruede, Ernst, 3,952,828.

Ruf, Walter; and Kelley, Robert George, to St. Regis Paper Company. Bag aligner machine. 3,953,020, Cl. 271-14.000.

Ruffalo, Peter D.: *See—*
Osten, John H.; Ruffalo, Peter D.; and Johnson, Donald L., 3,952,838.

Ruffing, Charles R.: *See—*
Langer, Alois; Scala, Luciano C.; and Ruffing, Charles R., 3,953,241.

Ruhrchemie Aktiengesellschaft: *See—*
Speth, Sebastian; Kuppenbender, Georg; and Jansen, Willi, 3,953,332.

Rumrill, Howard J., to Pet Incorporated. Container holder for ice cream cabinet or the like. 3,952,905, Cl. 220-14.000.

Runkle, Charles J.: *See—*
Golland, David I.; Junker, Bernhard T.; O'Connor, Gary E.; and Runkle, Charles J., 3,953,250.

Russell, Lewis K., to Signetics Corporation. Cross coupled semiconductor memory cell. 3,953,866, Cl. 357-44.000.

Ruter, Jorn: *See—*
Feinauer, Roland; Magosch, Karl-Heinz; and Ruter, Jorn, 3,953,405.

Ruther, Manfred: *See—*
Zernig, Ernst; and Ruther, Manfred, 3,952,368.

Rutherford, Dennis Franklin: *See—*
Walker, John Hirst; Rutherford, Dennis Franklin; and Sutton, James Anthony, 3,952,525.

Rutner, Herman; Rapun, Raul; and Lewin, Nathan, to Becton, Dickinson & Company. Derivatives of digoxigenin. 3,953,431, Cl. 260-239.570.

S. A. Texaco Belgium N.V.: *See—*
Dulog, Lothar G.; and Dewaele, Sylvain A. R., 3,953,530.

S. Ray Simon Associates Co.: *See—*
Stark, Allan P., 3,953,055.

S.S.S. Patents Limited: *See—*
Clements, Herbert Arthur, 3,952,460.

Saarinen, Veli A.: *See—*
Hine, Harrison William; and Saarinen, Veli A., 3,953,138.

Sabet, Huschang. Rotary-piston internal-combustion engine with two output shafts. 3,953,157, Cl. 418-36.000.

Saccomani, Georges; and Symaniec, Leonidas, to Thomson-CSF. Video tracking system. 3,953,669, Cl. 178-6.800.

Sace S.p.A. Construzioni Elettromeccaniche: *See—*
Mostosi, Angelo, 3,953,811.

Sada, Masao: *See—*
Fujita, Yutaka; Sawaki, Toru; Sasano, Tadahisa; and Sada, Masao, 3,953,472.

Safetran Systems Corporation: *See—*
Reinitz, Willard O., 3,952,978.

Safir, Sidney Robert, to American Cyanamid Company. Substituted benzodiazepin-10-ones and method of use. 3,953,430, Cl. 260-239.30T.

Sagami, Hiroshi: *See—*
Hosoi, Keizo; Sagami, Hiroshi; and Imai, Isao, 3,953,408.

St. Joe Minerals Corporation: *See—*
Prengaman, Raymond D., 3,953,244.

St. Regis Paper Company: *See—*
Ruf, Walter; and Kelley, Robert George, 3,953,020.

Saintsbury, John A., to United Aircraft of Canada Limited. Gas turbine control. 3,952,501, Cl. 60-39.230.

Saito, Hatsuo; Shiiki, Zenya; and Nakao, Masaaki, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Method for the production of activated carbon spheres containing nitrogen. 3,953,345, Cl. 252-423.000.

Saito, Koetsu: *See—*
Yano, Tsutomu; Nabeta, Yasumasa; Saito, Koetsu; and Watanabe, Akinori, 3,953,107.

Saito, Koichi: *See—*
Ohara, Takashi; Ono, Tetsuji; Ichihara, Shoichi; and Saito, Koichi, 3,953,369.

Saito, Mituo; and Takahashi, Kotaro, to Citizen Watch Co., Ltd. Automatic barrel winding mechanism. 3,952,498, Cl. 58-82.00A.

Saito, Shiro: *See—*
Hayashi, Hideo; Sato, Hisatake; and Saito, Shiro, 3,953,407.

Saito, Takumi; and Hayashi, Shigeki. Sintered micro-powder of tetrafluoroethylene polymers. 3,953,412, Cl. 526-247.000.

Sakabe, Nobuyuki: *See—*
Komatsu, Koei; Nishiyama, Shigeyuki; Sakabe, Nobuyuki; and Kogure, Akira, 3,953,409.

Sakai, Jiro: *See—*
Koyanagi, Haruo; Sato, Iwao; Yasuhara, Buhei; Sakai, Jiro; Yamauchi, Nobuharu; Matsumura, Masaji; and Morimoto, Katsuhide, 3,952,944.

Sakanoue, Seiki: *See—*
Imai, Shinichi; Fujita, Shinsaku; Maekawa, Yukio; and Sakanoue, Seiki, 3,953,211.

Sammes, Peter George: *See—*
Barton, Derek Harold Richard; and Sammes, Peter George, 3,953,424.

Samuel, Robert A.; and Layne, Michael W. J-shaped pin for making dental prothesis. 3,952,415, Cl. 32-11.000.

San/Bar Corporation: *See—*
Gabrielson, Bruce C., 3,953,683.

Sandberg, Kenneth F.: *See—*
Richards, Louis R.; and Sandberg, Kenneth F., 3,952,478.

Sandberg, Sven Olof; and Smith, Sven Robert E:son, to Avesta Jernverks Aktiebolag. Machine for dyeing or other wet-treatment of textiles. 3,952,558, Cl. 68-177.000.

Sandco Limited: *See—*
Wolfelsperger, Robert; and Bozzo, Richard J., 3,952,643.

Sanders, Ellsworth E.; and Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Closed container. 3,952,903, Cl. 220-4.00E.

Sanderson, John James: *See—*
Tedstone, Donald; Schaum, Hans-Herman; and Sanderson, John James, 3,952,972.

Sandoz, Inc.: *See—*
Anderson, Paul L., 3,953,525.
Houlihan, William J., 3,953,600.

Sandoz Ltd.: *See—*
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May, Max, 3,953,163.
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Sanford, Robert A.: *See—*
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Sangalli, Silvio: *See—*
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Sano, Reiji: *See—*
Hasegawa, Katsue; Sano, Reiji; Askawa, Shirow; and Matsuda, Shunsuke, 3,953,210.

Sansom, Michael, to Matburn (Holdings) Limited. Sealed container. 3,952,869, Cl. 206-363.000.

Santala, Teuvo J.; and Jost, Ernest M., to Texas Instruments Incorporated. Catalytic converter. 3,953,176, Cl. 23-288.0FC.

Santillo, George R., Jr.: *See—*
Pantusco, Anthony A.; Pinckney, Warren J.; Santillo, George R., Jr.; and Scharff, Gerard J., 3,953,281.

Sanyo Electric Co., Ltd.: *See—*
Arai, Takeshi, 3,953,765.

Saotome, Minoru; Yamamoto, Yoshikazu; Watani, Nobuo; and Kayama, Ryuichi, to Nippon Peroxide Co., Ltd.; and Showa Chemical Co., Ltd. Racemization of optically active tartaric acid. 3,953,504, Cl. 260-536.000.

Sappington, Vernon W.: *See—*
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Sargent & Greenleaf, Inc.: *See—*
Sopko, Riley M., 3,953,769.

Sarkozi, Maria Sz.: *See—*
Kisfaludy, Lajos; Low, Miklos; Schon, Istvan; Szirtes, Tamas; Sarkozi, Maria Sz.; Bajusz, Sandor; Turan, Andrae; Beks, Rosa; Juhasz, Attila; Graf, Laszlo; Medzihradszky, Kalman; and Szporny, Laszlo, 3,953,415.

Sarmiento, Rafael: *See—*
Beroza, Morton; Sarmiento, Rafael; and McGovern, Terrence P., 3,953,607.

Sasamura, Kohei; and Ishigaki, Yukinobu, to Victor Company of Japan, Ltd. Multichannel record disc recording system. 3,953,686, Cl. 179-100.4ST.

Sasano, Tadahisa: *See—*
Fujita, Yutaka; Sawaki, Toru; Sasano, Tadahisa; and Sada, Masao, 3,953,472.

Sassoli, Renato: *See—*
Chase, Thomas Louis; Duranti, Dino; and Sassoli, Renato, 3,953,209.

Satake, Toshihiko. Grain hulling and sorting apparatus. 3,952,645, Cl. 99-524.000.

Sato, Akira: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; Takano, Masao; and Miyasaka, Nobuaki, 3,953,215.
Hinata, Masanao; Takei, Haruo; Sato, Akira; and Ogawa, Akira, 3,953,216.

Sato, Hisatake: *See—*
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Sato, Iwao: *See—*
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Sato, Ken-Ichi: *See—*
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Sato, Tadashi: *See—*
Chibata, Ichiro; Tosa, Tetsuya; and Sato, Tadashi, 3,953,291.

Sato, Tadasu; and Yoshitake, Chuichi, to Fujitsu Ltd. Control method of a DC motor. 3,953,774, Cl. 318-594.000.

Satzinger, Gerhard: *See—*
Stoss, Peter; Satzinger, Gerhard; and Herrmann, Manfred, 3,953,464.

Sauer, Earl Salvator; and Vesperman, William Charles, to Western Electric Company, Inc. Strand material covered with clear flame retardant composition. 3,953,650, Cl. 428-389.000.

Saunders, Norman B. Heating and ventilation system. 3,952,947, Cl. 237-1.00A.

Saupe, Wolfram, to Hoechst Aktiengesellschaft. Fixing device for electrophotographic copying apparatus. 3,952,696, Cl. 118-60.000.

Saussier, Daniel: *See—*
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Savage, Michael: *See—*
Mergler, Harry W.; Wright, Daniel K.; Kicher, Thomas P.; Savage, Michael; and Kosc, Wieslaw, 3,952,572.

Sawada, Daisaku: *See—*
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Sawaki, Toru: *See—*
Fujita, Yutaka; Sawaki, Toru; Sasano, Tadahisa; and Sada, Masao, 3,953,472.

Sawyer, Robert H., to Cartridge Actuated Devices, Inc. Uniting two elements. 3,952,399, Cl. 29-432.000.

Sayles, David C., to United States of America, Army. Polynitroamine oxidizer containing propellant. 3,953,258, Cl. 149-19.300.

Sayles, David C., to United States of America, Army. Pressure exponent suppressants. 3,953,259, Cl. 149-19.500.

Scala, Luciano C.: *See—*
Langer, Alois; Scala, Luciano C.; and Ruffing, Charles R., 3,953,241.

Scarritt, Frank M., Sr. Infinitely adjustable level light. 3,953,726, Cl. 240-61.000.

Schaaf, Thomas K.: *See—*
Hess, Hans-Jurgen E.; Czuba, Leonard J.; and Schaaf, Thomas K., 3,953,466.

Schabert, Hans-Peter; Weber, Robert; and Bauer, Artur, to Siemens Aktiengesellschaft. Nuclear reactor installation. 3,952,885, Cl. 214-18.00N.

Schade, Otto Heinrich, Jr., to RCA Corporation. Current amplifier. 3,953,807, Cl. 330-35.000.

Schaffert, Richard L.: *See—*
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Scharff, Gerard J.: *See—*
Pantusco, Anthony A.; Pinckney, Warren J.; Santillo, George R., Jr.; and Scharff, Gerard J., 3,953,281.

Schattauer, Manfred. Cleaning apparatus for endless belt installation. 3,952,863, Cl. 198-230.000.

Schaum, Hans-Herman: *See—*
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Schaumburg, Ernest C.; and Larson, Robert K., to Standard Oil Company. Injection nozzle having guides for nozzle rod. 3,952,927, Cl. 222-510.000.

Scheibel, Karl-Heinz; Miheilowitsch, Nikolaus; and Goerndt, Heinz, to Siemens Aktiengesellschaft. Fastening arrangement for the switching mechanism cage of an electric switching apparatus. 3,953,699, Cl. 200-295.000.

Scheibitz, Wolfgang: *See—*
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Schell, Sidney T.: *See—*
Scieszinski, James L.; Dunstan, Ericsen M.; and Schell, Sidney T., 3,953,889.

Schering Aktiengesellschaft: *See—*
Klieger, Erich; Beich, Wolfgang; and Schroder, Eberhard, 3,953,501.

Scheuermann, Horst: *See—*
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Schmieder, Fritz: *See—*
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Schnelle, Manfred; Zernig, Ernst; and Wilke, Jurgen, to Richard Heinze, Firma. Stabilizing hinge for furniture with glass doors. 3,952,367, Cl. 16-147.000.

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Schonbeck, Rupert; Kloimstein, Engelbert; Diskus, Alfred; Auer, Engelbert; and Mayr, Hubert, to Chemie Linz Aktiengesellschaft. 3-Phenyl-6-halo-pyridazinyl thio-and dithio-carbonates. 3,953,445, Cl. 260-250.00A.

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Schulz, Gunter W., to Caterpillar Tractor Co. Marine gear assembly. 3,952,606, Cl. 74-377.000.

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Schwarz, William W.; and Stephens, William D., to Thiokol Corporation. Propellants and pyrotechnic compositions containing aluminum-coated ammonium perchlorate. 3,953,256, Cl. 149-5.000.

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Scieszinski, James L.; Dunstan, Ericsen M.; and Schell, Sidney T., to Pertec Corporation. Electronic head adjust system for removable magnetic discs. 3,953,889, Cl. 360-77.000.

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Scott, Peter H.; and Kober, Ehrenfried H., to Olin Corporation. Method for preparing aliphatic and cycloaliphatic isothiocyanates. 3,953,488, Cl. 260-454.000.

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Sebo, Milan J.; and Bartholomew, Roy E., to Bendix Corporation, The. Fluid pressure braking system including a pressure differential responsive valve device. 3,953,079, Cl. 303-7.000.

Seda, Miroslav: *See*—
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Seiter, Charles J., Jr., to Cliff Granberry Corporation. Remote power supply units for vehicles. 3,953,740, Cl. 307-10.00R.

Sejbal, Dalibor; Vasek, Vitezslav; Miks, Zbynek; and Prazak, Karel, to Vyzkumny ustav bavlsnarsky. Fabric stabilizing apparatus disposable at the input of the weft beat-up zone of travelling-wave shedding looms. 3,952,780, Cl. 139-291.00R.

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Seko, Maomi; and Kakihana, Hidetake. Concentration of uranium 235 in mixtures with uranium 238 using ion exchange resins. 3,953,569, Cl. 423-7.000.

Selonke, Fritz; and Bornfleth, Ulrich, to Hauni-Werke Korber & Co., KG. Apparatus for direct and circuitous transport of cigarettes or the like from manufacturing to processing machines. 3,952,854, Cl. 198-20.00C.

Seminario, Ezekiel. Valve core extraction tool. 3,952,394, Cl. 29-263.000.

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Shapiro, Eugene: *See*—
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Sinfelt, John H., to Exxon Research and Engineering Co. Polymetallic cluster compositions useful as hydrocarbon conversion catalysts. 3,953,368, Cl. 252-466.0PT.
Singh, Prithipal; and Ullman, Edwin F., to Syva Company. Cyclic and polycyclic diazadioxides as quenchers and radical inhibitors. 3,953,444, Cl. 260-250.0AC.
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Sone, Masao; Arai, Kojiro; and Nomura, Katsuaki, to Japan Exlan Company Limited. Acrylic synthetic fiber having animal hair-like hand. 3,953,651, Cl. 428-391.000.

Sonntag, Alois: *See*—
Goetzberger, Adolf; Schulz, Max; and Sonntag, Alois, 3,953,243.

Sono, Junji: *See*—
Fujiyoshi, Kanji; Mizumura, Yutaka; and Sono, Junji, 3,953,403.

Sopko, Riley M., to Sargent & Greenleaf, Inc. Electronic security control system. 3,953,769, Cl. 317-134.000.

Sorce, Peter S.; and Clifford, Earl W., to Aro Corporation, The. Laryngeal prosthesis. 3,952,335, Cl. 3-1.300.

Sorensen, Roy E., to Continental Can Company, Inc. Articulated air lead-in linkage for can body maker. 3,952,573, Cl. 72-342.000.

Sorgenicht, Dietrich: *See*—
Kubisiak, Helmut; and Sorgenicht, Dietrich, 3,953,736.

Souillard, Georges Jules; and Van Quaethoven, Frederic Francois, to Labofina S.A. Lubricating compositions. 3,953,179, Cl. 44-58.000.

Soum, Rene. Assembly of prefabricated prestressed concrete elements with the use of a poststressing link means. 3,952,468, Cl. 52-227.000.

Southern Illinois University Foundation: *See*—
Meyers, Cal Yale; and Matthews, Walter Sidney, III, 3,953,494.

Souzo, Isao: *See*—
Murakami, Masuo; Isaka, Ichiro; Koda, Akio; Kawahara, Norio; Ashiwagi, Teruya; Murakami, Yukiyasu; Yano, Kuniichiro; Nakano, Kohzi; and Souzo, Isao, 3,953,428.

Sowards, Brian David, to Whirlpool Corporation. Apparatus for treating lint in an automatic washer. 3,953,146, Cl. 415-121.00B.

Spain, Stanley R., to Walter Kidde & Company, Inc. Spring-loaded wear pads for crane booms. 3,952,466, Cl. 52-118.000.

Spaller, Albert Edward, Jr., to Eastman Kodak Company. Electrolytic cell construction. 3,953,314, Cl. 204-272.000.

Spaller, Albert Edward, Jr., to Eastman Kodak Company. Electrolytic cell construction. 3,953,315, Cl. 204-272.000.

Spanoudis, Louis, to Owens-Illinois, Inc. Food service tray. 3,952,794, Cl. 165-2.000.

Sparton Corporation: *See*—
Boyle, Charles F., 3,953,829.

Spearman, Robert R. Underwater trenching and cable laying apparatus. 3,952,532, Cl. 61-72.400.

Specht, Dieter, to Interroll Fordertechnik GmbH & Co. KG. Plastic link for conveyor chain having optimal three dimensional mobility. 3,952,860, Cl. 198-189.000.

Speidel, John A. Process and apparatus for forming sheet metal structures. 3,952,574, Cl. 72-379.000.

Speidel, Mathias A.: *See*—
Erath, Robert L.; Speidel, Mathias A.; and Kennelly, Edward J., 3,952,349.

Sperry Rand Corporation: *See*—
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Jacobson, Peter E., 3,952,566.

Sperry Rand Limited: *See*—
Keerie, Donald; Hammond, John Anthony Gordon; and Hamey, Peter Michael, 3,953,819.

Speth, Sebastian; Kuppenbender, Georg; and Jansen, Willi, to Ruhrchemie Aktiengesellschaft. Purification of waste water containing organic and inorganic impurities. 3,953,332, Cl. 210-71.000.

Spicer, John William: *See*—
Warren, Brian Thomas; and Spicer, John William, 3,953,604.

Spicer, Larry Dean; Pensack, Joseph Michael; Wilbur, Robert Daniel; and Demkovich, Gary Michael, deceased (by Demkovich, Ruth Ellen, executrix), to American Cyanamid Company. Ureidotetralin compounds. 3,953,506, Cl. 260-553.00A.

Spicer, Larry Dean; Pensack, Joseph Michael; Wilbur, Robert Daniel; and Demkovich, Gary Michael, deceased (by Demkovich, Ruth Ellen, administratrix), to American Cyanamid Company. Compositions and method of using ureidotetralin compounds or derivatives thereof. 3,953,606, Cl. 424-322.000.

Spitz, Melvin P. Bed frame having releasably interlocked side rails and crossbars. 3,952,345, Cl. 5-207.000.

SPOFA, United Pharmeceutical Works: *See*—
Zikan, Viktor; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, 3,953,454.

Spry, Douglas O., to Eli Lilly and Company. 3,4-Dicarboxycephalosporins and derivatives. 3,953,436, Cl. 260-243.00C.

Spurr, Ronald Frederick; Boardman, Colin Alan; and Yewen, John D., to H. Tinsley & Co. Ltd. Apparatus for and method for testing the number of turns on a coil. 3,953,791, Cl. 324-34.00R.

Srinivasan, Kollengode V.: *See*—
Allan, John L.; Srinivasan, Kollengode V.; Readio, Philip D.; and Cestero, Judit, 3,953,304.

Staehlin, Paul M.; and Nicholas, William. Vehicle shock absorber. 3,953,011, Cl. 267-48.000.

Stafford, John P.: *See*—
Cuccio, Allen B. J.; and Stafford, John P., 3,953,835.

Stampfer, Michael; Graeber, Ewald; Oni, Helmut; and Ruede, Ernst, to Maschinenfabrik FAHR AG. Automatic steering system for row-crop harvester and sensor therefor. 3,952,828, Cl. 180-97.000.

Standard Oil Company: *See*—
Connolly, John F., 3,953,305.
Knobloch, James O.; and Ramirez, Fausto, 3,953,481.
Lee, Richard J., 3,953,348.
Lee, Richard J., 3,953,349.
Meguerian, Garbis H.; and Kaneko, Yasuo, 3,953,576.
Puskas, Imre; and Cengel, John A., 3,953,475.
Schaumburg, Ernest C.; and Larson, Robert K., 3,952,927.

Stanford Research Institute: *See*—
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Stanley, Robert K., to Textured Yarn Co., Inc. Strand treatment apparatus. 3,952,385, Cl. 28-1.300.

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Stark, Allan P., to McCormick, Robert L.; and S. Ray Simon Associates Co., part interest to each. Off-highway trailer hitch. 3,953,055, Cl. 280-504.000.

Stata-Control System SCS AG: *See*—
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Stauffer Chemical Company: *See*—
Baker, Don R.; Walker, Francis H.; and Letchworth, Peter E., 3,953,477.
Baker, Don R., 3,953,478.
Baker, Don R.; and Walker, Francis H., 3,953,507.

Ste Superflexit: *See*—
Grihangne, Andre, 3,952,679.

Steele, James R., to Dynamic Air Inc. Bin aerator. 3,952,956, Cl. 239-289.000.

Steimann, Franz, to Didier Engineering GmbH. Coke oven door closure. 3,953,063, Cl. 292-144.000.

Stein, Werner; and Hartmann, Helmut, to Henkel & Cie G.m.b.H. Continuous process for the separation of mixtures of fatty substances of different melting points. 3,953,485, Cl. 260-428.000.

Steinberg, Harold Eugene: *See*—
Roitz, Nicholas Joseph; and Steinberg, Harold Eugene, 3,953,104.

Steiner, Kurt, to Hoffmann-La Roche Inc. Catalytic hydrogenation of alpha,beta-unsaturated aldehydes to alpha,beta-unsaturated alcohols. 3,953,524, Cl. 260-617.00A.

Steinkamp, Robert A.; and Grail, Thomas J., to Exxon Research and Engineering Company. Polymers with improved properties and process therefor. 3,953,655, Cl. 428-474.000.

Steinmuller, Gunter: *See*—
Brunner, Julius; Schwendtner, Manfred; and Steinmuller, Gunter, 3,953,795.

Steinstrasser, Ralf; and Weber, Georg, to Merck Patent Gesellschaft mit beschraenkter Haftung. Phenyl esters of 4-benzoyloxybenzoic acid. 3,953,491, Cl. 260-465.00D.

Stephens, William D.: *See*—
Schwarz, William W.; and Stephens, William D., 3,953,256.

Stephenson, Leslie: *See*—
Cook, Martin Christopher; Lawrence, Robin; Phillipps, Gordon Hanley; Hunter, Anne Christine; Newall, Christopher Earle; Stephenson, Leslie; and Weir, Niall Galbraith, 3,953,429.

Stettner & Co., Firma: *See*—
Bremstahler, Manfred, 3,953,771.

Stevens, Henry C.: *See*—
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Stewart, John Kenneth; and von Beckmann, Helmuth, to Canron, Inc. Device for laterally displacing a railroad track. 3,952,665, Cl. 104-8.000.

Stichting Waterbouwkundig Laboratorium: *See*—
Mann, Adriaan B.; and Vermeulen, Jacobus J. C., 3,952,600.

Stick, Danny R.: *See*—
Stick, Gerald A., 3,953,722.

Stick, Gerald A., to Stick, Danny R., a part interest. Flashlight support means. 3,953,722, Cl. 240-6.40W.

Stiftelsen Teknisk Hjalp at Handikappade Permobilstiftelsen: *See*—
Udden, Per; Graf, Siegfrid; and Engman, Bert, 3,952,822.

Stjernstrom, Nils Erik: *See*—
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Stockert, Heinz: *See*—
Neeb, Karl-Heinz; Stockert, Heinz; and Fuchs, Armin, 3,953,737.

Stockford, William F.; and Gamewell, Joseph M. Cyclone-type dust separator. 3,953,184, Cl. 55-458.000.

Stockwell, Henry James: *See*—
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Stokely, William R. Arm wrestling exercise machine. 3,953,026, Cl. 272-140.000.

Stolper, David Owen. Light trap. 3,953,870, Cl. 354-277.000.

Stone, James N.: *See*—
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Stone, W. James: *See*—
Schmidt, Joseph A.; and Stone, W. James, 3,952,664.

Stoss, Peter; Satzinger, Gerhard; and Herrmann, Manfred, to Warner-Lambert Company. Cyclic sulphoximides. 3,953,464, Cl. 260-302.00F.

Stotler, Harold H.: *See*—
Hoffert, Franklin D.; and Stotler, Harold H., 3,953,180.

Stout, Karl J., to Ohio Nuclear, Inc. Radiation sensing device. 3,953,735, Cl. 250-363.00S.

Stoy, Arthur. Polymers containing silver and copper. 3,953,545, Cl. 260-898.000.

Strauff, Gunther, to Langen & Co. Pressure medium control device. 3,952,631, Cl. 91-372.000.

Straus, Alan E.; Sweeney, William A.; House, Ralph; and Sharman, Samuel H., to Chevron Research Company. Foam well cleanout using oligomeric sulfonic acids. 3,953,338, Cl. 252-8.50C.

Strauss, Werner, to Klockner-Humboldt-Deutz Aktiengesellschaft. Agitation flotation cell for the preparation of minerals and coals. 3,953,552, Cl. 261-93.000.

Straza Enterprises Ltd.: *See*—
Straza, George T.; and Parr, Edward L., 3,952,575.

Straza, George T.; and Parr, Edward L., to Straza Enterprises Ltd. Bellows forming apparatus. 3,952,575, Cl. 72-393.000.

Streckenbach, Wulf-Christian, to Licentia Patent Verwaltungs-G.m.b.H. Remote control of broadcast receivers. 3,953,832, Cl. 340-171.00R.

Street, Evan H., Jr: *See*—
Templeton, Charles C.; Street, Evan H., Jr; and Richardson, Edwin A., 3,953,340.

Strepelis, John J.; and Gensler, Wayne C., to Bgthlehem Steel Corporation. Coke oven having a low burner heating wall and a high burner heating wall. 3,953,299, Cl. 202-139.000.

Striebel, Kenneth H., to Kofabco, Inc. Back mounting structure for a chair. 3,953,071, Cl. 297-454.000.

Stuckey, Ronald L.: *See*—
Kelver, William L.; Stuckey, Ronald L.; and Rozema, Arthur L., 3,953,821.

Studinka, Josef: *See*—
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Studtmann, George H.: *See*—
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Stull, Bertram O.; and Bullat, David M., to United States of America, Navy. High performance ramjet fuels. 3,952,505, Cl. 60-219.000.

Stupak, Adam Edward. Vehicle cupola structure and lift means. 3,952,464, Cl. 52-72.000.

Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, to Sumitomo Chemical Company, Limited. Process for the continuous production of dihydroperoxides. 3,953,521, Cl. 260-610.00B.

Sudo, Osamu, to Nippon Oil Seal Industry Co., Ltd. Device for sealing doors of coke oven. 3,952,454, Cl. 49-480.000.

Sueishi, Motoharu: *See*—
Kawarada, Junji; Endo, Kunio; Harada, Susumu; and Sueishi, Motoharu, 3,952,710.

Sugano, Junichiro; Kuriyama, Yasuhisa; Ishiuchi, Yukio; and Minamikawa, Yoshitugu, to Mitsubishi Gas Chemical Company, Inc. Process for producing quinones. 3,953,482, Cl. 260-396.00R.

Suganuma, Yasuyuki: *See*—
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Sugiura, Akio; Okamoto, Atsutoshi; and Suzuki, Motoyoshi, to Nippondenso Co., Ltd. Interface circuit. 3,953,748, Cl. 307-253.000.

Sugiyama, Masatoshi: *See*—
Inada, Kazutoshi; Sugiyama, Masatoshi; Nishigaki, Yasuo; and Tada, Sugihiko, 3,953,528.

Sukegawa, Tokuzo: *See*—
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 3,953,880.

Sukornick, Bernard, to Allied Chemical Corporation. Manufacture of oxygen difluoride. 3,953,585, Cl. 423-489.000.

Sultan, Stig Bertil: *See*—
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Hirano, Masachika; Mukai, Kunio; and Takeda, Hisami, 3,953,546.
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Sumitomo Metal Mining Company Limited: *See*—
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Summers, F. Wayne. Humidity indicating diaper cover. 3,952,746, Cl. 128-287.000.

Sun Electric Corporation: *See*—
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Sun Oil Company (Delaware): *See*—
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Sun Ventures, Inc.: *See*—
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Sundby, Bjorn, to Colgate-Palmolive Company. Liquid detergent. 3,953,380, Cl. 252-543.000.

Sundeen, Joseph E.: *See*—
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Sundstrand Corporation: *See*—
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Sundt, Erling, to Firmenich S.A. Cycloaliphatic compounds as odour- and taste-modifying agents. 3,953,534, Cl. 260-666.0PY.

Supanekar, Shashikant Dattatraya; and Daruwalla, Erach Hormasji, to Bombay Textile Research Association. Vat dye reduction process for use in a dyeing plant for textile processing. 3,953,307, Cl. 204-134.000.

Surace, Filippo; and Garetti, Marco, to Alfa Romeo S.p.A. Inflatable head protector. 3,953,049, Cl. 280-730.000.

Sutherland, Robert: *See*—
Cole, Martin; and Sutherland, Robert, 3,953,593.

Sutker, Leonard L. Method of separating fatty acid fractions. 3,953,484, Cl. 260-419.000.

Sutton, James Anthony: *See*—
Walker, John Hirst; Rutherford, Dennis Franklin; and Sutton, James Anthony, 3,952,525.

Suzuki, Kazuo; Hayashi, Yoshiaki; and Nagamine, Seiichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Self-bonding magnet wire and process of manufacturing same. 3,953,649, Cl. 428-383.000.

Suzuki, Motoaki; and Muroi, Hitoshi, to Toyo Ink Manufacturing Company, Ltd. Coating method. 3,953,626, Cl. 427-346.000.

Suzuki, Motoyoshi: *See*—
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Suzuki, Norio: *See*—
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Suzuki, Ryokuya: *See*—
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Suzuki, Yoshitake: *See*—
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Svensson, Tage Rolf Gunnar: *See*—
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Sweeney, William A.: *See*—
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Syeles, Albert M.: *See*—
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Synthelabo: *See*—
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Tabara, Yoshijiro; Akiyama, Hiroshi; Igawa, Masayuki; Maekawa, Tadashi; and Shinomiya, Tokuo, to Mitsubishi Rayon Company Limited. Process for manufacturing paper-like synthetic sheet. 3,953,282, Cl. 162-102.000.

Tada, Sugihiko: *See—*
Inada, Kazutoshi; Sugiyama, Masatoshi; Nishigaki, Yasuo; and Tada, Sugihiko, 3,953,528.

Taddeo, Fausto V.; and Pauly, Raymond W., to Pacific Electronic Enterprises, Inc. AC power source without a step-up output transformer. 3,953,788, Cl. 323-25.000.

Tagata, Genichi: *See—*
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Tajima, Akira: *See—*
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Takada, Juichiro, to Takata Kojyo Co., Ltd. Self-shaping woven inflatable belt and method of production. 3,953,640, Cl. 428-188.000.

Takada, Tadamichi: *See—*
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Takahashi, Kiyoshi: *See—*
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Takahashi, Kozo: *See—*
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Takai, Toshio. Process for fabricating a semiconductor device. 3,953,266, Cl. 156-11.000.

Takaku, Sakae: *See—*
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Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha. Concealed slide fastener having warp-knitted stringer tapes. 3,952,380, Cl. 24-205.13C.

Takano, Masao: *See—*
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Takano, Sho; Okuyama, Yasushi; Suzuki, Ryokuya; and Kinoshita, Ikuma, to Sumitomo Metal Mining Company Limited. Drilling system and method of pulling it up. 3,952,816, Cl. 175-67.000.

Takashima, Masaru, to Aikoh Co., Ltd. Powdery composition for heat retention of feeder head. 3,953,219, Cl. 106-38.270.

Takata Kojyo Co., Ltd.: *See—*
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Takebayashi, Yoshiaki: *See—*
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Takeda Chemical Industries, Ltd.: *See—*
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Takeda, Hisami: *See—*
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Takeda, Minoru: *See—*
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Takeyoshi, Yasuo: *See—*
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Takezoe, Shoichiro; Ogawa, Masao; and Nakamura, Junichi, to Showa Deuko Kabushiki Kaisha. Acrylonitrile-chlorinated polyethylene-styrene resinous molding compositions containing antimony trioxide. 3,953,540, Cl. 260-878.00R.

Takita, Tomohisa: *See—*
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Takusagawa, Takashi: *See—*
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Tamura, Hiroshi: *See—*
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Tamura, Takeo; and Ishida, Hideo, to Nissan Motor Company Limited; and Fuji Kiko Company Limited. Vehicle seat back tilt control mechanism. 3,953,069, Cl. 297-367.000.

Tamura, Yutaka: *See—*
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Tanaka, Koich; Tagata, Genichi; and Abe, Kiyomi, to Pentel Kabushiki Kaisha. Response analyzer. 3,952,425, Cl. 35-48.00R.

Tanaka, Kunihiko: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,953,521.

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Tanimura, Waichi. Process for purifying gases containing H_2S. 3,953,586, Cl. 423-575.000.

Tanis, Peter G. Method for preheating aircooled, aircraft engines. 3,953,707, Cl. 219-205.000.

Taniyasu, Ryozo: *See—*
Isa, Hiroshi; Ukigai, Toshiyuki; Tominaga, Anry; Taniyasu, Ryozo; and Nagayama, Masuzo, 3,953,361.

Tanner, Donald E., to D & T Manufacturing Co. Apparatus and method for application of hot-melt resin adhesive. 3,952,921, Cl. 222-146.0HE.

Tanner, Howard Carl: *See—*
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Tanney, John W.: *See—*
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Tant, William A. Clip for semi-automatic firearm. 3,952,441, Cl. 42-50.000.

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Tauschek, Max J., to TRW Inc. Valve rotator. 3,952,713, Cl. 123-90.300.

Tavares, Robert F.; Agran, Jack; Easter, William M.; and Blau, Leslie, to Givaudan Corporation. 4,7-Dihydro-2-(3-pentyl)-1,3-dioxepin as a flavorant. 3,953,614, Cl. 426-536.000.

Taylor, Duane F. Needle-carried, transthoracic, cannula-type cardiac resuscitation instrument. 3,952,742, Cl. 128-172.100.

Taylor, George William Charles: *See—*
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Taylor, John D.; and Whitmer, Tommy R., to Goldblatt Tool Company. Ceiling hanger. 3,953,015, Cl. 269-46.000.

Taylor, Robert E. Automatic water sprinkler for irregular areas. 3,952,954, Cl. 239-236.000.

Taylor, William L.: *See—*
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Teach, Ted L., to Laserplane Corporation. Laser beam control system for earthworking or similar machines. 3,953,145, Cl. 404-84.000.

Team Form AG: *See—*
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Technology Marketing Incorporated: *See—*
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Tecumseh Products Company: *See—*
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Tedstone, Donald; Schaum, Hans-Herman; and Sanderson, John James, to United Aircraft of Canada Limited. Inertial separator. 3,952,972, Cl. 244-53.00B.

Teichert, Allen L. Dual fulcrum switch. 3,953,697, Cl. 200-243.000.

Teijin Limited: *See—*
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Kawase, Shoji; Shima, Takeo; Inata, Hiroo; and Kurisu, Shizuka, 3,953,539.
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Teletype Corporation: *See—*
Bonkoske, Gerry L., 3,952,697.
Tellie, Paul E. Firearms having two orifices for ejection of the empty shells. 3,952,440, Cl. 42-1.00R.
Telxon Corporation: *See—*
Bell, William Sherman, Jr., 3,953,785.
Templeton, Charles C.; Street, Evan H., Jr; and Richardson, Edwin A., to Shell Oil Company. Dissolving siliceous materials with self-acidifying liquid. 3,953,340, Cl. 252-8.55C.
Tenneco Chemicals, Inc.: *See—*
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Tennery, Victor J.: *See—*
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Terada, Hideto: *See—*
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Terayama, Susumu; and Mameda, Noriyoshi, to Mitsui Shipbuilding & Engineering Co., Ltd. Method of containers handling in container yards. 3,952,891, Cl. 214-152.000.
Teres, Leonid Nikolaevich: *See—*
Gelfand, Mikhail Lvovich; Tsipenjuk, Yakov Isaakovich; Podlesnykh, Petr Ivanovich; Antipov, Georgy Afanasievich; Goldshtein, Boris Grigorievich; Lavnikov, Nikolai Stanislavovich; Teres, Leonid Nikolaevich; Urazhdin, Ivan Ivanovich; and Yakubovsky, Petr Stepanovich, 3,952,814.
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Terzian, Rouben T., to Marvin Glass & Associates. Articulated figure toy. 3,952,449, Cl. 46-161.000.
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Thayer, Paul M., to Water Pollution Control Corporation. Sewage treatment aeration systems. 3,953,553, Cl. 261-122.000.
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Patarcity, Adam J.; and Smith, Daniel J., 3,953,006.
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Tholen, John H.; and Winters, John C., to Minnesota Mining & Manufacturing Company. Automatic camera for dual printing plates. 3,953,873, Cl. 354-315.000.
Thoma, Jozsef, to Linden-Alimak AB. Construction hoist conveying system. 3,952,836, Cl. 187-2.000.
Thomas & Betts Corporation: *See—*
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Thomas, Dwight L., to Vulcan Corporation. Sectional shoe mid-sole. 3,952,429, Cl. 36-31.000.
Thomas, Franklin B., III: *See—*
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Thomas, Paul D., to Pfizer Inc. Organic acid derivatives. 3,953,616, Cl. 426-637.000.
Thompson, Elmer R. Sewing machine feed conversion apparatus. 3,952,675, Cl. 112-212.000.
Thompson, Robert M., to Sun Ventures, Inc. Tertiary diamide lubricants. 3,953,346, Cl. 252-51.50A.
Thomson-CFS: *See—*
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Tokuoka, Yasumichi; Umeki, Shinji; and Kubota, Yuichi, to TDK Electronic Company. Magnetic recording medium and preparation thereof. 3,953,656, Cl. 428-539.000.
Tokuyama Soda Kabushiki Kaisha: *See—*
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Tomita, Tadayoshi, to Toyo Engineering Corporation. Method of producing gaseous mixture rich in hydrogen. 3,953,356, Cl. 252-373.000.
Tomita, Tamaki; Ishikawa, Mineo; Kodama, Hayashi; and Moriya, Kazuo, to Toyoda-Koki Kabushiki-Kaisha. Grinding machine with feed rate changing apparatus. 3,952,458, Cl. 51-165.770.
Tomizawa, Shogo: *See—*
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Chandross, Edwin Arthur; Pryde, Coralie Anne; Tomlinson, Walter John, III; and Weber, Heinz Paul, 3,953,620.
Tomura, Hiroshi, to Aoki Ltd. Ornamental clock. 3,952,500, Cl. 58-126.00D.
Tonkyn, Richard G.; Vorchheimer, Norman; Fowler, William J., Jr.; and Heberle, Richard A., to Betz Laboratories, Inc. Water-soluble cationic polymeric materials and their use. 3,953,330, Cl. 210-52.000.

Toomey, Robert D., to N L Industries, Inc. Process for purifying molten magnesium chloride. 3,953,574, Cl. 423-178.000.

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Torii, Osamu. Nozzle device for cleanser foam suction apparatus. 3,952,362, Cl. 15-353.000.

Tosa, Tetsuya: *See—*
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Townsend Engineering Company: *See—*
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Townsend, Loren R. Brake means for an air-powered sprinkler system. 3,952,768, Cl. 137-344.000.

Townsend, Loren R. Brake means for an air-powered sprinkler system. 3,952,952, Cl. 239-177.000.

Townsend, Phillip. Quick-release fasteners. 3,952,626, Cl. 85-33.000.

Townsend, Robert H.: *See—*
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Toyo Boseki Kabushiki Kaisha: *See—*
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Toyo Ink Manufacturing Company, Ltd.: *See—*
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Truitt, James K., to Texas Instruments Incorporated. Thermal paper coating. 3,953,659, Cl. 428-511.000.

Trutnovsky, Helmut; and Paletta, Benno, to Kreidl Chemico Physical Kommanditgesellschaft, The. Enzyme recovery by ultrafiltration in enzymatic analysis. 3,953,296, Cl. 195-103.50R.

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Drutchas, Gilbert H., 3,952,827.
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Tucker, Kenneth, to Tucker Systems, Inc. Automatic steering system for vessels with a wireless remote control and course change capability. 3,952,681, Cl. 114-144.00A.

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Turnbo, Roy G.; Walker, David G.; and Rosen, Marvin, to Tenneco Chemicals, Inc. Flame-retardant wood containing 1,1,2,4-tetrabromobutene-2 and process for its production. 3,953,627, Cl. 427-427.000.

Turner, Frederick Henry, to Simon-Carves Limited. Cryogenic storage tanks. 3,952,531, Cl. 62-45.000.

Turner, Harold L.: *See—*
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Turner, Richard W. Sled. 3,952,354, Cl. 9-310.00B.

Turner, Robert M.; and Langland, Herbert Z., to Allis-Chalmers Corporation. Hydrostatic drive circuit. 3,952,511, Cl. 60-430.000.

Tuseth, Robert D.: *See—*
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Tyco Laboratories, Inc.: *See—*
LaBelle, Harold E., Jr., 3,953,174.

Tyree, Lewis, Jr. CO_2-snow-making. 3,952,530, Cl. 62-10.000.

Ube Industries, Ltd.: *See—*
Yamazaki, Toshiharu; Nakai, Mamoru; and Kuroki, Yoshiaki, 3,953,514.

Uchida, Yasuo, to Ishikawa Tekko Kabushiki Kaisha. Ball joint. 3,953,139, Cl. 403-140.000.

Udden, Per; Graf, Siegfrid; and Engman, Bert, to Stiftelsen Teknisk Hjalp at Handikappade Permobilstiftelsen. Electrically powered wheel-chair for indoor and outdoor use. 3,952,822, Cl. 180-21.000.

Udden, Per; Graf, Siegfrid; and Engman, Bert, to Permobilstiftelsen. Hand operated wheel-chair. 3,953,054, Cl. 280-242.0WC.

Ueda, Yuji: *See—*
Suda, Hideaki; Dohgane, Iwao; Chinuki, Takashi; Tanimoto, Kenji; Hosaka, Hirokazu; Nakao, Yukimichi; Ueda, Yuji; Imada, Seiya; Yanagihara, Hideki; and Tanaka, Kunihiko, 3,953,521.

Ueno, Niro; and Shiraishi, Ippei, to Mitsui Toatsu Chemicals, Incorporated; and Topacs, Incorporation. Cylindrical winding core for carrying a roll of elongated windable material. 3,952,963, Cl. 242-68.500.

Ueth, Ewald: *See—*
Reimann, Christian; Weber, Hugo; and Ueth, Ewald, 3,953,696.

Uhlig, Klaus, to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft. Hollow body for heated gases. 3,952,777, Cl. 138-149.000.

Ukigai, Toshiyuki: *See—*
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Ulrich Foundation, Inc.: *See—*
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Ulrich, Raymond M., to Ulrich Foundation, Inc. Slit trenching and cable laying device. 3,952,810, Cl. 172-40.000.

Ultra Centrifuge Nederland N.V.: *See—*
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Zaidan Hojin Biseibutsu Kagaku Kenkyu Kai: *See—*
Umezawa, Hamao; Takita, Tomohisa; Muraoka, Yasuhiko; and Fujii, Akio, 3,953,594.

Zauberman, Juan L.: *See—*
Wirtschafter, Jonathan D.; Zauberman, Juan L.; and Moscowitz, Samuel, 3,952,735.

Zeidman, Robert: *See*—
Lipfert, Donald E.; Romney, Seymour L.; Zeidman, Robert; and Goldschmidt, Willfred, 3,952,737.
Zenith Radio Corporation: *See*—
Glorioso, Edward J.; and Lerner, Martin L., 3,953,276.
Podowski, Robert R., 3,953,801.
Zerlin, William Max Erich: *See*—
Avery, Roger Peter; and Zerlin, William Max Erich, 3,953,098.
Zernig, Ernst; and Ruther, Manfred. Hinges. 3,952,368, Cl. 16-163.000.
Zernig, Ernst: *See*—
Schnelle, Manfred; Zernig, Ernst; and Wilke, Jurgen, 3,952,367.
Zetterberg, Lars Henning: *See*—
Sjostrand, Jan Roland; and Zetterberg, Lars Henning, 3,953,798.
Zikan, Viktor; Semonsky, Miroslav; Rezabek, Karel; Seda, Miroslav; and Auskova, Marie, to SPOFA, United Pharmeceutical Works. N-(D-6-methyl-8-isoergoline-I-yl)-N',N'-diethylurea. 3,953,454, Cl. 260-285.500.
Zimmer, Robert E., to Addressograph Multigraph Corporation. Cleaning of corona electrodes. 3,953,772, Cl. 317-262.00A.
Zimmerman, John, to Somerville Industries Limited. Bottom locking carton. 3,952,941, Cl. 229-41.00B.
Zimmermann, Joseph J., to GTE Automatic Electric Laboratories Incorporated. Remote control transcribing device. 3,953,680, Cl. 179-6.00E.
Zincone, Robert: *See*—
Galli, Charles V.; and Zincone, Robert, 3,952,601.
Zinn, Werner G., Jr.: *See*—
Layton, Allen C.; Zinn, Werner G., Jr.; Mendez, Antonio J.; Howle, Robert E.; and Bayston, Thomas E., 3,953,667.
Zip-Up Lighting Tower Company, Inc.: *See*—
Partlow, Jackson A., 3,952,467.
Zoecon Corporation: *See*—
Anderson, Richard J.; and Henrick, Clive A., 3,953,532.
Zorbaugh, William R., to American Chain & Cable Company, Inc. Hoist with load limiting device. 3,953,000, Cl. 254-169.000.
Zunker, David William: *See*—
Murphy, Charles Vincent; and Zunker, David William, 3,953,386.
Zwisler, Oswald: *See*—
Konig, Wolfgang; Zwisler, Oswald; and Guthorlein, Gerhard, 3,953,417.

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 24,017	3,914,140	Oct. 21, 1975	B 288,627	3,916,179	Oct. 28, 1975
B 24,018	3,914,206	Oct. 21, 1975	B 288,638	3,925,132	Dec. 9, 1975
B 64,868	3,914,141	Oct. 21, 1975	B 289,175	3,924,309	Dec. 9, 1975
B 78,331	3,914,142	Oct. 21, 1975	B 289,471	3,917,184	Nov. 4, 1975
B 112,422	3,913,484	Oct. 21, 1975	B 289,523	3,921,166	Nov. 18, 1975
B 150,560	3,913,654	Oct. 21, 1975	B 289,883	3,925,063	Dec. 9, 1975
B 176,995	3,915,773	Oct. 28, 1975	B 290,328	3,924,838	Dec. 9, 1975
B 178,475	3,944,602	Mar. 16, 1976	B 291,104	3,925,007	Dec. 9, 1975
B 189,772	3,925,367	Dec. 9, 1975	B 291,694	3,925,339	Dec. 9, 1975
B 189,773	3,925,405	Dec. 9, 1975	B 292,054	3,915,877	Oct. 28, 1975
B 190,679	3,925,346	Dec. 9, 1975	B 292,126	3,914,465	Oct. 21, 1975
B 198,810	3,916,043	Oct. 28, 1975	B 292,140	3,914,340	Oct. 21, 1975
B 204,161	3,924,605	Dec. 9, 1975	B 292,300	3,927,167	Dec. 16, 1975
B 207,272	3,914,123	Oct. 21, 1975	B 292,563	3,923,653	Dec. 2, 1975
B 211,786	3,914,300	Oct. 21, 1975	B 293,378	3,923,725	Dec. 2, 1975
B 213,211	3,925,269	Dec. 9, 1975	B 293,437	3,913,414	Oct. 21, 1975
B 220,683	3,914,471	Oct. 21, 1975	B 294,103	3,924,396	Dec. 9, 1975
B 222,188	3,914,739	Oct. 21, 1975	B 294,579	3,916,737	Nov. 4, 1975
B 223,621	3,925,526	Dec. 9, 1975	B 294,673	3,916,023	Oct. 28, 1975
B 224,323	3,925,476	Dec. 9, 1975	B 295,481	3,921,593	Nov. 25, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 295,674	3,916,107	Oct. 28, 1975
B 233,741	3,925,326	Dec. 9, 1975	B 295,860	3,923,880	Dec. 2, 1975
B 235,011	3,925,086	Dec. 9, 1975	B 299,267	3,917,106	Nov. 4, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 300,353	3,921,734	Nov. 25, 1975
B 236,609	3,925,187	Dec. 9, 1975	B 302,271	3,929,130	Dec. 30, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 302,692	3,924,598	Dec. 9, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 302,836	3,923,573	Dec. 2, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,998	3,928,233	Dec. 23, 1975
B 245,194	3,919,179	Nov. 11, 1975	B 303,011	3,930,188	Dec. 30, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 303,655	3,924,642	Dec. 9, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 303,702	3,914,131	Oct. 21, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 304,687	3,924,783	Dec. 9, 1975
B 252,947	3,923,803	Dec. 2, 1975	B 305,417	3,915,882	Oct. 28, 1975
B 254,211	3,917,677	Nov. 4, 1975	B 305,868	3,921,463	Nov. 25, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,881	3,923,478	Dec. 2, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 306,829	3,925,411	Dec. 9, 1975
B 256,334	3,924,988	Dec. 9, 1975	B 306,938	3,916,050	Oct. 28, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 307,677	3,915,276	Oct. 28, 1975
B 258,687	3,914,221	Oct. 21, 1975	B 308,661	3,924,349	Dec. 9, 1975
B 259,236	3,924,874	Dec. 9, 1975	B 308,892	3,919,624	Nov. 11, 1975
B 259,274	3,928,688	Dec. 23, 1975	B 309,207	3,914,743	Oct. 21, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 309,499	3,922,002	Nov. 25, 1975
B 260,945	3,925,250	Dec. 9, 1975	B 309,681	3,927,374	Dec. 16, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,755	3,919,468	Nov. 11, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,756	3,914,136	Oct. 21, 1975
B 262,241	3,925,528	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 262,378	3,914,410	Oct. 21, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 265,727	3,914,479	Oct. 21, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,911	3,925,233	Dec. 9, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 271,104	3,925,400	Dec. 9, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,900	3,915,932	Oct. 28, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 314,271	3,921,845	Nov. 25, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 316,917	3,925,494	Dec. 9, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 283,124	3,923,512	Dec. 2, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,624	3,925,167	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 318,618	3,915,365	Oct. 28, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 285,796	3,914,303	Oct. 21, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 319,402	3,919,568	Nov. 11, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,414	3,928,666	Dec. 23, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 320,261	3,924,033	Dec. 2, 1975
B 287,275	3,925,141	Dec. 9, 1975	B 320,452	3,925,083	Dec. 9, 1975
B 287,373	3,918,568	Nov. 11, 1975	B 320,603	3,915,571	Oct. 28, 1975
B 288,018	3,925,239	Dec. 9, 1975	B 321,018	3,921,623	Nov. 25, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 321,101	3,917,163	Nov. 4, 1975	B 346,350	3,915,824	Oct. 28, 1975
B 321,938	3,923,889	Dec. 2, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,182	3,925,390	Dec. 9, 1975	B 346,585	3,913,820	Oct. 21, 1975
B 322,239	3,920,973	Nov. 18, 1975	B 346,613	3,923,545	Dec. 2, 1975
B 322,564	3,914,373	Oct. 21, 1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,611	3,920,863	Nov. 18, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 322,777	3,924,382	Dec. 9, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,127	3,923,967	Dec. 2, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,191	3,914,566	Oct. 21, 1975	B 348,558	3,914,109	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975	B 349,177	3,914,033	Oct. 21, 1975
B 323,666	3,924,568	Dec. 9, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,495	3,928,664	Dec. 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,503	3,928,524	Dec. 23, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,505	3,925,294	Dec. 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,739	3,924,990	Dec. 9, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,102	3,924,355	Dec. 9, 1975	B 350,245	3,914,331	Oct. 21, 1975
B 325,262	3,921,304	Nov. 25, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 326,514	3,925,080	Dec. 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,109	3,925,350	Dec. 9, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,363	3,923,504	Dec. 2, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,612	3,925,620	Dec. 9, 1975	B 351,055	3,914,074	Oct. 21, 1975
B 327,674	3,918,540	Nov. 11, 1975	B 351,218	3,914,186	Oct. 21, 1975
B 327,899	3,925,674	Dec. 9, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,164	3,914,703	Oct. 21, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,200	3,916,031	Oct. 28, 1975	B 351,421	3,914,733	Oct. 21, 1975
B 328,205	3,914,106	Oct. 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 328,870	3,916,486	Nov. 4, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,115	3,924,727	Dec. 9, 1975	B 351,672	3,914,000	Oct. 21, 1975
B 329,476	3,920,562	Nov. 18, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,612	3,925,128	Dec. 9, 1975	B 351,863	3,914,700	Oct. 21, 1975
B 329,787	3,920,688	Nov. 18, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 329,816	3,923,947	Dec. 2, 1975	B 351,926	3,914,133	Oct. 21, 1975
B 330,536	3,925,452	Dec. 9, 1975	B 351,939	3,913,480	Oct. 21, 1975
B 330,828	3,913,589	Oct. 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,417	3,914,157	Oct. 21, 1975	B 352,934	3,913,692	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975	B 352,950	3,922,590	Nov. 25, 1975
B 331,895	3,916,403	Oct. 28, 1975	B 352,965	3,921,926	Nov. 25, 1975
B 332,527	3,924,017	Dec. 2, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 332,811	3,924,359	Dec. 9, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975	B 353,546	3,913,273	Oct. 21, 1975
B 333,928	3,927,172	Dec. 16, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,251	3,924,719	Dec. 9, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975	B 354,145	3,927,279	Dec. 16, 1975
B 334,985	3,923,912	Dec. 2, 1975	B 354,296	3,914,580	Oct. 21, 1975
B 335,670	3,928,686	Dec. 23, 1975	B 354,510	3,928,658	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,889	3,913,204	Oct. 21, 1975
B 335,773	3,920,953	Nov. 18, 1975	B 354,979	3,914,251	Oct. 21, 1975
B 336,129	3,923,606	Dec. 2, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,243	3,925,422	Dec. 9, 1975	B 355,269	3,914,561	Oct. 21, 1975
B 336,345	3,925,179	Dec. 9, 1975	B 355,510	3,913,704	Oct. 21, 1975
B 336,652	3,914,211	Oct. 21, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,902	3,918,897	Nov. 11, 1975	B 355,876	3,925,685	Dec. 9, 1975
B 336,946	3,919,425	Nov. 11, 1975	B 356,032	3,928,636	Dec. 23, 1975
B 336,978	3,923,968	Dec. 2, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,235	3,919,386	Nov. 11, 1975	B 356,602	3,927,393	Dec. 16, 1975
B 337,409	3,925,258	Dec. 9, 1975	B 356,724	3,924,586	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975	B 357,039	3,924,406	Dec. 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,057	3,913,738	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,057	3,924,822	Dec. 9, 1975	B 357,402	3,914,180	Oct. 21, 1975
B 339,218	3,925,121	Dec. 9, 1975	B 357,682	3,924,973	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976	B 357,803	3,919,470	Nov. 11, 1975
B 339,838	3,930,221	Dec. 30, 1975	B 358,174	3,924,958	Dec. 9, 1975
B 340,212	3,922,645	Nov. 25, 1975	B 358,244	3,913,411	Oct. 21, 1975
B 340,833	3,925,208	Dec. 9, 1975	B 358,311	3,923,561	Dec. 2, 1975
B 341,579	3,913,363	Oct. 21, 1975	B 358,939	3,924,713	Dec. 9, 1975
B 342,084	3,928,694	Dec. 23, 1975	B 359,174	3,914,117	Oct. 21, 1975
B 342,423	3,925,334	Dec. 9, 1975	B 359,187	3,924,525	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975	B 359,540	3,915,235	Oct. 28, 1975
B 343,136	3,919,453	Nov. 11, 1975	B 359,740	3,936,212	Feb. 3, 1976
B 343,240	3,925,693	Dec. 9, 1975	B 359,791	3,929,430	Dec. 30, 1975
B 343,506	3,916,021	Oct. 28, 1975	B 359,825	3,921,344	Nov. 25, 1975
B 343,577	3,921,165	Nov. 18, 1975	B 359,946	3,914,132	Oct. 21, 1975
B 344,203	3,928,719	Dec. 23, 1975	B 359,947	3,914,653	Oct. 21, 1975
B 344,479	3,924,042	Dec. 2, 1975	B 360,208	3,923,750	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975	B 360,296	3,916,720	Nov. 4, 1975
B 345,384	3,916,146	Oct. 28, 1975	B 360,719	3,915,715	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976	B 360,910	3,925,696	Dec. 9, 1975
B 345,422	3,914,392	Oct. 21, 1975	B 361,265	3,923,569	Dec. 2, 1975
B 345,527	3,927,365	Dec. 16, 1975	B 361,443	3,927,405	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975	B 361,569	3,914,554	Oct. 21, 1975
B 346,165	3,913,293	Oct. 21, 1975	B 361,604	3,922,702	Nov. 25, 1975
B 346,210	3,916,142	Oct. 28, 1975	B 361,734	3,915,764	Oct. 28, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 362,589	3,914,012	Oct. 21, 1975	B 387,039	3,924,510	Dec. 9, 1975
B 363,205	3,923,744	Dec. 2, 1975	B 387,331	3,913,701	Oct. 21, 1975
B 363,337	3,928,639	Dec. 23, 1975	B 387,363	3,927,378	Dec. 16, 1975
B 363,457	3,922,595	Nov. 25, 1975	B 387,687	3,918,151	Nov. 11, 1975
B 363,674	3,929,716	Dec. 30, 1975	B 387,761	3,914,245	Oct. 21, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,790	925,380	Dec. 9, 1975
B 363,962	3,921,826	Nov. 25, 1975	B 387,818	918,935	Nov. 11, 1975
B 364,022	3,913,499	Oct. 21, 1975	B 388,580	3,923,712	Dec. 2, 1975
B 364,163	3,916,092	Oct. 28, 1975	B 389,070	3,914,171	Oct. 21, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 389,285	3,914,631	Oct. 21, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 389,327	3,924,504	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975	B 389,639	3,914,626	Oct. 21, 1975
B 364,786	3,921,673	Nov. 25, 1975	B 389,726	3,921,010	Nov. 18, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,807	3,922,623	Nov. 25, 1975
B 365,490	3,918,527	Nov. 11, 1975	B 389,932	3,913,268	Oct. 21, 1975
B 365,834	3,914,702	Oct. 21, 1975	B 389,933	3,913,267	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975	B 390,679	3,913,668	Oct. 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,287	3,924,946	Dec. 9, 1975	B 391,184	3,914,214	Oct. 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 391,210	3,914,220	Oct. 21, 1975
B 366,589	3,914,719	Oct. 21, 1975	B 391,437	3,915,416	Oct. 28, 1975
B 367,021	3,914,752	Oct. 21, 1975	B 391,509	3,925,175	Dec. 9, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,675	3,916,017	Oct. 28, 1975
B 367,661	3,914,158	Oct. 21, 1975	B 392,154	3,923,809	Dec. 2, 1975
B 367,739	3,923,648	Dec. 2, 1975	B 392,242	3,926,636	Dec. 16, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 392,696	3,916,175	Oct. 28, 1975
B 368,081	3,924,691	Dec. 9, 1975	B 392,732	3,914,903	Oct. 21, 1975
B 368,387	3,924,923	Dec. 9, 1975	B 392,753	3,916,341	Oct. 28, 1975
B 368,392	3,913,812	Oct. 21, 1975	B 392,894	3,914,763	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 393,163	3,914,535	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 393,970	3,914,638	Oct. 21, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 394,088	3,914,740	Oct. 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 394,300	3,914,159	Oct. 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,712	3,916,306	Oct. 28, 1975
B 371,073	3,930,135	Dec. 30, 1975	B 395,478	3,922,577	Nov. 25, 1975
B 371,085	3,923,783	Dec. 2, 1975	B 395,496	3,919,435	Nov. 11, 1975
B 371,787	3,921,217	Nov. 18, 1975	B 395,671	3,920,418	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975	B 395,889	3,913,190	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975	B 396,025	3,913,869	Oct. 21, 1975
B 372,823	3,924,660	Dec. 9, 1975	B 396,551	3,921,929	Nov. 25, 1975
B 373,297	3,924,436	Dec. 9, 1975	B 397,027	3,923,736	Dec. 2, 1975
B 373,326	3,920,433	Nov. 18, 1975	B 397,527	3,913,488	Oct. 21, 1975
B 373,428	3,915,511	Oct. 28, 1975	B 397,990	3,914,848	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975	B 398,262	3,913,481	Oct. 21, 1975
B 375,652	3,921,303	Nov. 25, 1975	B 398,551	3,924,924	Dec. 9, 1975
B 376,504	3,914,570	Oct. 21, 1975	B 398,597	3,913,743	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975	B 398,625	3,920,996	Nov. 18, 1975
B 376,742	3,924,392	Dec. 9, 1975	B 399,292	3,914,810	Oct. 28, 1975
B 376,799	3,913,955	Oct. 21, 1975	B 399,304	3,919,567	Nov. 11, 1975
B 377,172	3,918,255	Nov. 11, 1975	B 399,349	3,925,694	Dec. 9, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,766	3,915,667	Oct. 28, 1975
B 377,833	3,913,884	Oct. 21, 1975	B 400,080	3,925,163	Dec. 9, 1975
B 377,869	3,917,002	Nov. 4, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 378,621	3,923,840	Dec. 2, 1975	B 400,310	3,915,507	Oct. 28, 1975
B 379,038	3,923,994	Dec. 2, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,172	3,914,379	Oct. 21, 1975	B 401,992	3,924,898	Dec. 9, 1975
B 379,282	3,913,462	Oct. 21, 1975	B 402,065	3,925,413	Dec. 9, 1975
B 379,955	3,913,157	Oct. 21, 1975	B 402,555	3,914,688	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975	B 403,140	3,913,486	Oct. 21, 1975
B 380,141	3,925,161	Dec. 9, 1975	B 403,355	3,913,352	Oct. 21, 1975
B 380,310	3,921,048	Nov. 18, 1975	B 403,990	3,914,684	Oct. 21, 1975
B 380,312	3,913,953	Oct. 21, 1975	B 403,996	3,916,016	Oct. 28, 1975
B 380,338	3,924,873	Dec. 9, 1975	B 404,290	3,924,918	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975	B 404,437	3,915,200	Oct. 28, 1975
B 380,900	3,913,307	Oct. 21, 1975	B 405,136	3,915,565	Oct. 28, 1975
B 380,926	3,925,095	Dec. 9, 1975	B 405,137	3,915,566	Oct. 28, 1975
B 381,074	3,919,583	Nov. 11, 1975	B 405,160	3,924,821	Dec. 9, 1975
B 381,632	3,914,732	Oct. 21, 1975	B 405,248	3,926,294	Dec. 16, 1975
B 381,847	3,921,152	Nov. 18, 1975	B 405,305	3,922,111	Nov. 25, 1975
B 382,018	3,929,742	Dec. 30, 1975	B 405,360	3,913,403	Oct. 21, 1975
B 382,021	3,913,212	Oct. 21, 1975	B 405,495	3,924,577	Dec. 9, 1975
B 382,261	3,914,991	Oct. 28, 1975	B 405,938	3,920,109	Nov. 18, 1975
B 382,290	3,924,717	Dec. 9, 1975	B 406,065	3,914,199	Oct. 21, 1975
B 382,783	3,919,527	Nov. 11, 1975	B 406,357	3,924,529	Dec. 9, 1975
B 382,798	3,924,435	Dec. 9, 1975	B 406,800	3,952,708	Apr. 27, 1976
B 382,840	3,922,007	Nov. 25, 1975	B 407,736	3,924,463	Dec. 9, 1975
B 383,465	3,927,412	Dec. 16, 1975	B 407,357	3,924,614	Dec. 9, 1975
B 383,532	3,914,246	Oct. 21, 1975	B 407,728	3,925,240	Dec. 9, 1975
B 383,581	3,925,318	Dec. 9, 1975	B 408,487	3,924,046	Dec. 2, 1975
B 384,499	3,925,135	Dec. 9, 1975	B 408,749	3,914,116	Oct. 21, 1975
B 384,658	3,913,452	Oct. 21, 1975	B 409,026	3,925,497	Dec. 9, 1975
B 384,773	3,915,416	Oct. 28, 1975	B 409,220	3,915,648	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975	B 409,251	3,922,620	Nov. 25, 1975
B 386,403	3,924,895	Dec. 9, 1975	B 409,657	3,927,362	Dec. 16, 1975
B 386,592	3,925,305	Dec. 9, 1975	B 409,816	3,921,317	Nov. 25, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 410,062	3,923,855	Dec. 2, 1975
B 410,168	3,914,717	Oct. 21, 1975
B 411,145	3,914,168	Oct. 21, 1975
B 411,356	3,919,649	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975
B 411,633	3,914,741	Oct. 21, 1975
B 412,516	3,927,417	Dec. 16, 1975
B 412,619	3,925,292	Dec. 9, 1975
B 412,867	3,924,587	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975
B 413,546	3,924,314	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975
B 414,288	3,925,537	Dec. 9, 1975
B 415,113	3,915,717	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975
B 415,845	3,925,076	Dec. 9, 1975
B 415,847	3,914,208	Oct. 21, 1975
B 415,957	3,925,635	Dec. 9, 1975
B 415,977	3,927,359	Dec. 16, 1975
B 416,598	3,923,473	Dec. 2, 1975
B 416,832	3,924,975	Dec. 9, 1975
B 416,710	3,923,746	Dec. 2, 1975
B 416,933	3,924,968	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975
B 418,121	3,925,023	Dec. 9, 1975
B 418,153	3,925,251	Dec. 9, 1975
B 418,302	3,913,252	Oct. 21, 1975
B 419,327	3,921,197	Nov. 18, 1975
B 419,481	3,924,970	Dec. 9, 1975
B 420,016	3,914,572	Oct. 21, 1975
B 420,148	3,927,414	Dec. 16, 1975
B 420,514	3,923,929	Dec. 2, 1975
B 420,568	3,925,069	Dec. 9, 1975
B 421,026	3,914,785	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975
B 421,383	3,925,047	Dec. 9, 1975
B 421,797	3,914,023	Oct. 21, 1975
B 422,399	3,928,656	Dec. 23, 1975
B 422,467	3,924,804	Dec. 9, 1975
B 422,949	3,921,873	Nov. 25, 1975
B 424,415	3,919,458	Nov. 11, 1975
B 424,462	3,920,522	Nov. 18, 1975
B 424,572	3,924,979	Dec. 9, 1975
B 424,748	3,924,395	Dec. 9, 1975
B 425,035	3,914,025	Oct. 21, 1975
B 425,345	3,922,015	Nov. 25, 1975
B 425,470	3,923,796	Dec. 2, 1975
B 425,539	3,916,742	Nov. 4, 1975
B 425,541	3,914,051	Oct. 21, 1975
B 425,572	3,923,822	Dec. 2, 1975
B 427,631	3,921,433	Nov. 25, 1975
B 428,177	3,914,624	Oct. 21, 1975
B 428,795	3,921,056	Nov. 18, 1975
B 429,442	3,923,485	Dec. 2, 1975
B 430,106	3,918,941	Nov. 11, 1975
B 430,140	3,922,084	Nov. 25, 1975
B 430,798	3,918,204	Nov. 11, 1975
B 430,944	3,922,096	Nov. 25, 1975
B 432,373	3,919,670	Nov. 11, 1975
B 433,587	3,914,567	Oct. 21, 1975
B 435,343	3,919,244	Nov. 11, 1975
B 435,844	3,925,170	Dec. 9, 1975
B 437,173	3,924,627	Dec. 9, 1975
B 437,172	3,913,251	Oct. 21, 1975
B 437,195	3,914,618	Oct. 21, 1975
B 437,450	3,922,479	Nov. 25, 1975
B 438,053	3,916,013	Oct. 28, 1975
B 438,706	3,925,050	Dec. 9, 1975
B 439,168	3,919,676	Nov. 11, 1975
B 439,669	3,921,499	Nov. 25, 1975
B 440,898	3,921,789	Nov. 25, 1975
B 441,024	3,913,629	Oct. 21, 1975
B 441,416	3,913,851	Oct. 21, 1975
B 442,280	3,914,054	Oct. 21, 1975
B 442,859	3,918,570	Nov. 11, 1975
B 442,919	3,925,483	Dec. 9, 1975
B 444,614	3,927,996	Dec. 23, 1975
B 445,471	3,914,711	Oct. 21, 1975
B 445,740	3,923,612	Dec. 2, 1975
B 448,571	3,924,760	Dec. 9, 1975
B 449,647	3,916,797	Nov. 4, 1975
B 450,499	3,920,526	Nov. 18, 1975
B 450,546	3,924,417	Dec. 9, 1975
B 450,927	3,913,844	Oct. 21, 1975
B 455,520	3,922,543	Nov. 25, 1975
B 455,775	3,914,356	Oct. 21, 1975
B 456,346	3,914,531	Oct. 21, 1975
B 459,425	3,928,773	Dec. 23, 1975
B 461,872	3,919,586	Nov. 11, 1975
B 467,684	3,915,119	Oct. 28, 1975
B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 27TH DAY OF APRIL, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Cardinal of Adrian, Inc.: *See*—
MacDonald, Robert D., Re. 28,786.

Chang, Catherine Teh-Lin, to Du Pont de Nemours, E. I., and Company. Photopolymerizable compositions containing cyclic cis-α-dicarbonyl compounds and selected sensitizers. Re. 28,789, Cl. 96-86.00P.

Du Pont de Nemours, E. I., and Company: *See*—
Chang, Catherine Teh-Lin, Re. 28,789.

Grozier, John David: *See*—
Korchynsky, Michael; Grozier, John David; and Mihelich, John L., Re. 28,790.
Korchynsky, Michael; Grozier, John David; and Mihelich, John L., Re. 28,791.

Jones & Laughlin Steel Corporation: *See*—
Korchynsky, Michael; Grozier, John David; and Mihelich, John L., Re. 28,790.
Korchynsky, Michael; Grozier, John David; and Mihelich, John L., Re. 28,791.

K-G Industries, Inc.: *See*—
Moore, James E., Re. 28,787.

Korchynsky, Michael; Grozier, John David; and Mihelich, John L., to Jones & Laughlin Steel Corporation. High-strength low-alloy steels having improved formability. Re. 28,790, Cl. 148-36.000.

Korchynsky, Michael; Grozier, John David; and Mihelich, John L., to Jones & Laughlin Steel Corporation. High-strength plain carbon steels having improved formability. Re. 28,791, Cl. 148-36.000.

MacDonald, Robert D., to Cardinal of Adrian, Inc. Hinge for latchless door. Re. 28,786, Cl. 16-141.000.

Mihelich, John L.: *See*—
Korchynsky, Michael; Grozier, John David; and Mihelich, John L., Re. 28,790.
Korchynsky, Michael; Grozier, John David; and Mihelich, John L., Re. 28,791.

Moore, James E., to K-G Industries, Inc. Method and system for hot de-oiling and hot briquetting. Re. 28,787, Cl. 29-403.000.

Ruka, Roswell J.; and Weissbart, Joseph, to Westinghouse Electric Corporation. Electrochemical method for separating O_2 from a gas; generating electricity; measuring O_2 partial pressure; and fuel cell. Re. 28,792, Cl. 204-1.00T.

Weissbart, Joseph: *See*—
Ruka, Roswell J.; and Weissbart, Joseph, Re. 28,792.

Westinghouse Electric Corporation: *See*—
Ruka, Roswell J.; and Weissbart, Joseph, Re. 28,792.

Williamson, George R., III. Load restrainer. Re. 28,788, Cl. 280-179.00R.

LIST OF PLANT PATENTEES

Bull, Norbert, to Mikkelsens, Inc. Kalanchoe plant. 3,871, 4-27-76, Cl. 68.

Bull, Norbert, to Mikkelsens, Inc. Kalanchoe plant. 3,872, 4-27-76, Cl. 68.

Bull, Norbert, to Mikkelsens, Inc. Kalanchoe plant. 3,873, 4-27-76, Cl. 68.

Duffett, William E., and W. W. Knicely, to Yoder Brothers, Inc. Geranium plant. 3,874, 4-27-76, Cl. 68.

Duffett, William E., and W. W. Knicley, to Yoder Brothers, Inc. Geranium plant. 3,875, 4-27-76, Cl. 68.

Knicely, Walter W.: *See*—
Duffett, William E., and Knicely. 3,874.
Duffett, William E., and Knicely. 3,875.

Mikkelsens, Inc.: *See*—
Bull, Norbert. 3,871.
Bull, Norbert. 3,872.
Bull, Norbert. 3,873.

Yoder Brothers, Inc.: *See*—
Duffett, William E., and Knicely. 3,874.
Duffett, William E., and Knicely. 3,875.

LIST OF DESIGN PATENTEES

AMI Industries, Inc.: *See*—
Smith, Harry M. 239,693.

Adkinson, Joseph E. Cocktail table. 239,672, 4-27-76, Cl. D6—177.

Alabardo, Martin. Lighting fixture. 239,729, 4-27-76, Cl. D48—23.

Allen, George D., H. D. Haubein, M. B. Goe, Jr., and K. A. Toeniskoetter, to A.B. Chance Co. Combined buss and current limiting fuse for transformers. 239,717, 4-27-76, Cl. D26—1.

Andersson, Karl G. B., to Duni Bila AB. Bowl. 239,686, 4-27-76, Cl. D7—1.

Ashton, Harold P., to Dart Industries, Inc. Container grid or the like. 239,691, 4-27-76, Cl. D7—130.

Ashton, Harold P., to Dart Industries, Inc. Container grid or the like. 239,692, 4-27-76, Cl. D7—130.

Aven Tools Ltd.: *See*—
Ward, Brian, and Scarrow. 239,694.

Baker, James W., to Daniel C. Hanna. Car wash building. 239,701. 4-27-76, Cl. D13—1.

Barleen, David G., R. L. Ridings, and T. O. Pollard, to Emergency Products Corp. Alarm system cabinet. 239,706, 4-27-76, Cl. D10—106.

Blake, Jack E. Stand for supporting a rock specimen. 239,678, 4-27-76, Cl. D6—85.

Bloch, Jack, to Foster Grant Co., Inc. Spectacle front. 239,735, 4-27-76, Cl. D57—1.

Borg-Warner Corp.: *See*—
Szucs, Robert J. 239,679.
Szucs, Robert J. 239,680.

Bouchard, Eleanor. Swim suit. 239,667, 4-27-76, Cl. D2—25.

Breger, Carl-Arne. Coffee pot. 239,687, 4-27-76, Cl. D7—65.

Bukaitz, Finley M., and George Neuser, to Delta Industries, Inc. Above ground swimming pool or similar article. 239,702, 4-27-76, Cl. D13—1.

Carter, John S. Modular pedestal unit. 239,674, 4-27-76, Cl. D6—85.

Century Wheels Research Corp.: *See*—
Morgan, Paul A. 239,704.

Chance, A. B., Co.: *See*—
Allen, George D. Haubein, Goe, and Toeniskoetter. 239,717.

Chieda, Robert A.: *See*—
Maruca, Joseph P., and Chieda. 239,700.

Dart Industries, Inc.: *See*—
Ashton, Harold P. 239,691.
Ashton, Harold P. 239,692.

Davis, Myron F., Jr., and C. A. Pycha, to International Business Machines Corp. Printer station. 239,721, 4-27-76, Cl. D26—5.

Dazey Products Co.: *See*—
McNair, Samuel L. 239,739.

Delta Industries, Inc.: *See*—
Bukaitz, Finley M., and Neuser. 239,702.

Doman, Donald W., and G. A. Rau, to Flambeau Products Corp. Cutting board. 239,688. 4-27-76, Cl. D7—46.

Doman, Donald W., and G. A. Rau, to Flambeau Products Corp. Cutting board. 239,689. 4-27-76. Cl. D7—46.

Dudley, Harvey H., R. I. Gresens, D. E. Hansen, S. H. Miller, and R. C. Sutliff, to Eastman Kodak Co. Loaded film cartridge. 239,736, 4-27-76, Cl. D61—1.

Duni Bila AB: *See*—
Andersson, Karl G. B. 239,686.

Eastman Kodak Co.: *See*—
Dudley, Harvey H., Gresens, Hansen, Miller, and Sutliff. 239,736.

Emergency Products Corp.: *See*—
Barleen, David G., Ridings, and Pollard. 239,706.

Farmer, William H. Tissue box holder. 239,682, 4-27-76, Cl. D6—85.

Feck, Norman L.: *See*—
Kuzara, James H., Feck, and Johnston. 239,724.

Fier, Edward J., Jr., to Norwesco, Inc. Container. 239,695, 4-27-76, Cl. D9—237.

Finlof, Milton. Toilet seat for invalids. 239,715, 4-27-76, Cl. D23—71.

Flambeau Products Corp.: *See*—
Doman, Donald W., and Rau. 239,688.
Doman, Donald W., and Rau. 239,689.

Foster Grant Co., Inc.: *See*—
Bloch, Jack. 239,735.

Fratelli Saporiti: *See*—
Offredi, Giovanni. 239,671.

GTE Lenkurt Inc.: *See*—
Stewart, James R. 239,720.

Gardisette International AG: *See*—
Schroeder, Peter E. 239,728.

Garrison, James R., to Textron, Inc. Light twin helicopter. 239,710, 4–27–76, Cl. D12—73.
Giurtino, Joel F., to Sandoz, Inc. Manifold nebulizer unit. 239,737, 4–27–76, Cl. D83—1.
Giurtino, Joel F., to Sandoz, Inc. Manifold nebulizer unit. 239,738, 4–27–76, Cl. D83—1.
Glaberson, Martin, to Warner-Lambert Co. Tray for releasably engaging a razor and a blade dispenser. 239,696, 4–27–76, Cl. D9—186.
Glaberson, Martin, to Warner-Lambert Co. Tray for releasably engaging a razor and a blade cartridge dispenser. 239,699, 4–27–76, Cl. D9—186.
Gresens, Robert I.: *See*—
Dudley, Harvey H., Gresens, Hansen,, Miller, and Sutliff. 239,736.
Grimaldo, Samuel. Vehicle hoisting trailer. 239,707, 4–27–76, Cl. D12—56.
Hanna, Daniel C.: *See*—
Baker, James W. 239,701.
Haubein, Harold D.: *See*—
Allen, George D., Haubein, Goe, and Toeniskoetter. D239,717.
Horino, Kazutaka, and T. Sato, to Yamaha Hatsudoki Kabushiki Kaisha. Bicycle. 239,708, 4–27–76, Cl. D12—111.
Hunt, Kenneth W., to Hunt-Wilde Corp. Bottle. 239,697, 4–27–76, Cl. D9—37.
Hunt-Wilde Corp.: *See*—
Hunt, Kenneth W. 239,697.
Intercollection Development S.A.: *See*—
Tuttle, Paul. 239,683.
International Business Machines Corp.: *See*—
Davis, Myron F., Jr., and Pycha. 239,721.
International Pretzel Corp.: *See*—
Peterson, Jeffrey E. 239,685.
Jacobs, Raymond, to Kalso Systemet, Inc. Foot sock. 239,669, 4–27–76. Cl. D2—33.
Johnston, Vincent P.: *See*—
Kuzara, Feck, and Johnston. 239,724.
Kalso Systemet, Inc.: *See*—
Jacobs, Raymond. 239,669.
Kindred, Lawrence E. Combined golf club handle and shaft. 239,725, 4–27–76, Cl. D34—5.
Kitson, Gerald L. Chain link for poultry feed conveyor. 239,731, 4–27–76, Cl. D55—1.
Kumpfer, Beverly D., to Utah State University Foundation. Microwave oven. 239,690, 4–27–76, Cl. D7—128.
Kuzara, James H., N. L. Feck, and V. P. Johnston. Stock-watering trough. 239,724, 4–27–76, Cl. D30—16.
Lund, Allan W. Windshield visor for trucks. 239,705, 4–27–76, Cl. D12—191.
Manual Arts Furniture Co.: *See*—
Smith, Donald R. 239,681.
Martin, William F. Ash collector. 239,723, 4–27–76, Cl. D27—8.
Maruca, Joseph P., and R. A. Chieda, to Textron Inc. Rotary card file. 239,700, 4–27–76, Cl. D19—76.
McGinley, Julianne L. Bassinet. 239,676, 4–27–76, Cl. D6—15.
McNair, Samuel L., to Dazey Products Co. Electric hair curling iron. 239,739, 4–27–76, Cl. D86—10.
Milross Controls, Inc.: *See*—
Tems, Adam. 239,716.
Modicon Corp.: *See*—
Powers, Howard A. 239,718.
Mommsen, Maxine T. Handbag for carrying bingo accessories. 239,741, 4–27–76, Cl. D87—3.
Moncrief, J. D. Combined highway flare and stand therefor. 239,703, 4–27–76, Cl. D10—114.
Morgan, Paul A., to Century Wheels Research Corp. Micrometer. 239,704, 4–27–76. Cl. D10—73.
Neuser, George: *See*—
Bukaitz, Finley M., and Neuser. 239,702.
Noe, Gaye F. Counter height bar table or the like. 239,675, 4–27–76, Cl. D6—27.
Norwesco, Inc.: *See*—
Fier, Edward J., Jr. 239,695.
Offredi, Giovanni, to Fratelli Saporiti. Upholstered seat. 239,671, 4–27–76, Cl. D6—47.
Pearl-Wick Corp.: *See*—
Solomon, Jack. 239,713.
Peterson, Jeffrey E., to International Pretzel Corp. Display unit. 239,685, 4–27–76, Cl. D6—175.
Pollard, Theodore O.: *See*—
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141 3,952,722
247 3,952,723
271 3,952,724
3,952,725

CLASS 127

5 3,953,224

CLASS 128

1R 3,952,726
2F 3,952,729
2G 3,952,730
2R 3,952,728
2.06 3,952,731
24A 3,952,732
66 3,952,736
94 3,952,733
127 3,952,737
130 3,952,734
132D 3,952,738
145.8 3,952,739
3,952,740
163 3,952,735
172.1 3,952,742
260 3,952,741
276 3,952,743
283 3,952,727
287 3,952,744
3,952,745
3,952,746
303R 3,952,747
303.14 3,952,748
321 3,952,749
419D 3,952,750
422 3,952,751
486 3,952,752

CLASS 131

235R 3,952,753

CLASS 132

120 3,952,754
161 3,952,755

CLASS 134

9 3,953,225
104 3,953,226
133 3,952,756
134 3,952,757

CLASS 135

5AT 3,952,758

CLASS 136

6FS 3,953,227
3,953,228
3,953,229
3,953,233
6LN 3,953,230
3,953,232
3,953,234
20 3,953,235
26 3,953,236
62 3,953,231
86R 3,953,237
90 3,953,238
100R 3,953,239
107 3,953,240
145 3,953,241
155 3,953,242

CLASS 137

12 3,952,759
82 3,952,760
91 3,952,761
102 3,952,762
119 3,952,763
3,952,764
171 3,952,765
218 3,952,766
268 3,952,767
344 3,952,768
3,952,769
360 3,952,770
491 3,952,771
565 3,952,772
604 3,952,773
625.38 3,952,775
625.5 3,952,774

CLASS 138

39 3,952,776
149 3,952,777

CLASS 139

54 3,952,778
110 3,952,779
291R 3,952,780

CLASS 141

46 3,952,781
100 3,952,782

CLASS 144

3D 3,952,783
28.1 3,952,784

CLASS 148

1.5 3,953,243
2 3,953,244
3 3,953,245
11.5R 3,953,246
13 3,953,247
15 3,953,248
32.5 3,953,249
36 Re.28,790
Re.28,791
3,953,250
105 3,953,251
121 3,953,252
131 3,953,253
175 3,953,254
187 3,953,255

CLASS 149

5 3,953,256
7 3,953,257
19.3 3,953,258
19.5 3,953,259
19.92 3,953,260
36 3,953,261
3,953,262

CLASS 151

13 3,953,267
21B 3,952,785

CLASS 152

323 3,952,786
347 3,952,787

CLASS 156

7 3,953,263
3,953,264
8 3,953,265
11 3,953,266
71 3,953,268
79 3,953,269
80 3,953,270
85 3,953,271
152 3,953,272
224 3,953,273
252 3,953,274
278 3,953,275
345 3,953,276
360 3,953,277
361 3,953,278
513 3,953,279
515 3,953,280
618 3,953,281

CLASS 160

84R 3,952,788
168R 3,952,789
193 3,952,790

CLASS 162

102 3,953,282
158 3,953,283
352 3,953,284

CLASS 164

49 3,952,791
52 3,952,792
160 3,952,793

CLASS 165

2 3,952,794
30 3,952,795
40 3,952,796
80 3,952,797
105 3,952,798

CLASS 166

116 3,952,799
249 3,952,800
256 3,952,801
262 3,952,802
270 3,952,803
278 3,952,804
293 3,952,805
294 3,952,806

CLASS 168

28 3,952,807

CLASS 169

61 3,952,808
3,952,809

CLASS 172

40 3,952,810
45 3,952,811
375 3,952,812

CLASS 173

91 3,952,813
93 3,952,814

CLASS 174

17.05 3,953,662
68.5 3,953,663
3,953,664
153G 3,953,665

CLASS 175

67 3,952,816
240 3,952,817
277 3,952,818
293 3,952,819
374 3,952,815

CLASS 176

66 3,953,285
3,953,286
78 3,953,287
79 3,953,288
87 3,953,289

CLASS 178

5.6 3,953,666
6 3,953,667
3,953,668
6.6A 3,953,681
6.8 3,953,669
3,953,670
7.2 3,953,671
7.3D 3,953,672
68 3,953,673
69.5 3,953,674

CLASS 179

1HF 3,953,676
1E 3,953,675
1.5R 3,953,677
3,953,678
6E 3,953,680
6R 3,953,679
18FA 3,953,682
84A 3,953,683
90K 3,953,684
100.1DR 3,953,685
100.4ST 3,953,686
115.5R 3,953,687
147 3,953,688

CLASS 180

1R 3,952,820
19R 3,952,821
21 3,952,822
64A 3,952,823
73D 3,952,824
82R 3,952,827
97 3,952,828
105E 3,952,829
136 3,952,826
139 3,952,825

CLASS 181

33G 3,952,830
3,952,831
116 3,952,832
118 3,952,833
150 3,952,834

CLASS 185

11 3,952,835

CLASS 187

2 3,952,836
29R 3,952,837

CLASS 188

31 3,952,838
62 3,952,839
71.4 3,952,842
3,952,843
71.8 3,952,840
3,952,841
72.8 3,952,844
196D 3,952,845
264R 3,952,846

CLASS 190

41Z 3,952,847

CLASS 191

331 3,952,848

CLASS 192

41A 3,952,849

CLASS 194

1N 3,952,850
100A 3,952,851

CLASS 195

1.8 3,953,290
63 3,953,292
96 3,953,293
103.5R 3,953,294
3,953,295
3,953,296
3,953,297

CLASS 196

36P 3,953,291
133 3,953,298

CLASS 197

19 3,952,852
55 3,952,853

CLASS 198

20C 3,952,854
32 3,952,855
37 3,952,856
41 3,952,857
103 3,952,858
110 3,952,859
189 3,952,860
204 3,952,861
213 3,952,862
230 3,952,863
232 3,952,864
240 3,952,865
262 3,952,866

CLASS 200

51R 3,953,689
61.08 3,953,690
61.46 3,953,691
83P 3,953,692
144B 3,953,693
147A 3,953,694
150C 3,953,695
157 3,953,696
243 3,953,697
279 3,953,698
295 3,953,699

CLASS 202

139 3,953,299

CLASS 203

53 3,953,300
75 3,953,301

CLASS 204

1T Re.28,792
14N 3,953,302
15 3,953,303
49 3,953,304
97 3,953,305
106 3,953,306
134 3,953,307
140 3,953,308
159.16 3,953,309
181 3,953,310
197 3,953,311
198 3,953,312
267 3,953,313
272 3,953,314
3,953,315
288 3,953,316

CLASS 206

229 3,952,867
273 3,952,868
363 3,952,869
369 3,952,870
455 3,952,871
526 3,952,872
528 3,952,873

CLASS 208

11LE 3,953,317
3,953,318
25 3,953,319
111 3,953,320
216 3,953,321
255 3,953,322
3,953,323
321 3,953,324

CLASS 209

73 3,952,874
273 3,953,325

CLASS 210

7 3,953,326
3,953,327
3,953,328
22R 3,953,329
52 3,953,330
63R 3,953,331
71 3,953,332
74 3,953,333
321R 3,953,334

CLASS 211

41 3,952,875
50 3,952,876
64 3,952,878
105.5 3,952,877

CLASS 212

39MS 3,952,879

CLASS 214

1CM 3,952,880
6B 3,952,881
6D 3,952,882
8.5E 3,952,884
8.5K 3,952,883
18N 3,952,885
38BA 3,952,886
38C 3,952,887
41R 3,952,888
42R 3,952,889
82 3,953,170
138R 3,952,890
152 3,952,891
340 3,952,892
450 3,952,893
451 3,952,894
506 3,952,895
771 3,952,896

CLASS 215

11C 3,952,897
12R 3,952,898
217 3,952,899
232 3,952,900
251 3,952,901
306 3,952,902

CLASS 219

10.55M 3,953,703
10.55R 3,953,702
10.79 3,953,700
10.81 3,953,701
76 3,953,704
121L 3,953,706
121P 3,953,705
205 3,953,707
216 3,953,708
3,953,709
370 3,953,710
464 3,953,711

CLASS 220

4E 3,952,903
5R 3,952,904
14 3,952,905
18 3,952,906
3,952,907
3,952,908
21 3,952,909
90.4 3,952,910
269 3,952,911
3,952,912
273 3,952,913
339 3,952,914

CLASS 221

75 3,952,915

CLASS 222

70 3,952,916
78 3,952,917
82 3,952,918
89 3,952,919
137 3,952,920
146HE 3,952,921
148 3,952,922
174 3,952,923
181 3,952,924
485 3,952,925
494 3,952,926
510 3,952,927
564 3,952,928

CLASS 223

94 3,952,929

CLASS 224

2C 3,952,930
69 3,952,942

CLASS 225

103 3,952,931

CLASS 226

3.2 3,953,411
49 3,952,932
118 3,952,933

CLASS 227

88 3,952,934
120 3,952,935

CLASS 228

49 3,952,936
110 3,952,937
190 3,952,938
193 3,952,939

CLASS 229

41B 3,952,941
114BA 3,952,940

CLASS 234

116 3,952,943

CLASS 235

61.11D 3,953,712
92CT 3,952,944
92DN 3,953,713
150.2 3,953,714
150.21 3,953,715
3,953,716
153AK 3,953,717
156 3,953,718
3,953,719
168 3,953,720
180 3,953,721

CLASS 236

15B 3,952,945
34 3,952,946

CLASS 237

1A 3,952,947

CLASS 238

243 3,952,948

CLASS 239

2S 3,952,949
14 3,952,950
15 3,952,951
177 3,952,952
230 3,952,953
236 3,952,954
288.5 3,952,955
289 3,952,956

CLASS 240

6.4W 3,953,722
11.1 3,953,723
44.2 3,953,724
51.11R 3,953,725
61 3,953,726

CLASS 241

73 3,952,957
162 3,952,958

CLASS 242

18PW 3,952,959
25A 3,952,960
54R 3,952,961
3,952,962
68.5 3,952,963
77.1 3,952,964
96 3,952,965
107.4R 3,952,966
3,952,967
182 3,952,968
205 3,952,969

CLASS 244

3.23 3,952,970
35R 3,952,971
53B 3,952,972
54 3,952,973
137R 3,952,974
153R 3,952,975
158 3,952,976

CLASS 246

37 3,952,977
477 3,952,978

CLASS 248

20 3,952,979
22 3,952,980
124 3,952,982
173 3,952,983
282 3,952,984
291 3,952,981
317 3,952,985
354R 3,952,986
408 3,952,987
441B 3,952,988
453 3,952,989

CLASS 249

63 3,952,990
66A 3,952,991
104 3,952,992

CLASS 250

199 3,953,727
201 3,953,728
3,953,729
227 3,953,730
287 3,953,732
290 3,953,731
330 3,953,733
343 3,953,734
358R 3,953,736
363S 3,953,735
432R 3,953,737
475 3,953,738
571 3,953,739

CLASS 251

20 3,952,993
210 3,952,994
232 3,952,995
324 3,952,996

CLASS 252

8.5A 3,953,335
3,953,336
3,953,337
8.5C 3,953,338
8.55C 3,953,340
8.55D 3,953,341
3,953,342
8.9 3,953,339
12 3,953,343
32.7E 3,953,344
48.6 3,953,347
51 3,953,348
3,953,349
51.5A 3,953,346
94 3,953,350
132 3,953,351
142 3,953,352
174 3,953,353
187H 3,953,354
301.1R 3,953,355
373 3,953,356
378R 3,953,357
407 3,953,358
408 3,953,359
423 3,953,345
428 3,953,360
429R 3,953,361
431N 3,953,362
443 3,953,363
455Z 3,953,364
3,953,365
3,953,366
463 3,953,367

466PT 3,953,368
472 3,953,369
473 3,953,370
512 3,953,371
518 3,953,372
3,953,373
3,953,374
520 3,953,375
521 3,953,376
522 3,953,377
3,953,378
527 3,953,379
543 3,953,380
544 3,953,381
548 3,953,382

CLASS 254

63 3,952,997
124 3,952,998
134.3R 3,952,999
169 3,953,000

CLASS 259

4AB 3,953,002
4R 3,953,001
3,953,003
23 3,953,004
191 3,953,006

CLASS 260

2BP 3,953,383
2.5AC 3,953,384
2.5P 3,953,385
17A 3,953,386
17.3 3,953,421
18EP 3,953,388
18TN 3,953,387
23.7M 3,953,389
28.5AS 3,953,390
29.6TA 3,953,391
30.4A 3,953,392
31.8R 3,953,393
40R 3,953,394
3,953,395
45.75B 3,953,397
45.8A 3,953,396
45.85B 3,953,398
45.85H 3,953,399
47R 3,953,400
49 3,953,401
62 3,953,402
75M 3,953,404
75T 3,953,403
3,953,405
77.5AM 3,953,406
112.5LH 3,953,416
112.5R 3,953,415
3,953,417
112.7 3,953,418
143 3,953,419
152 3,953,420
210F 3,953,423
210R 3,953,422
239BF 3,953,427
239A 3,953,424
239B 3,953,425
3,953,426
239.1 3,953,428
239.3T 3,953,430
239.55R 3,953,429
239.57 3,953,431
240D 3,953,433
3,953,434
240E 3,953,432
240R 3,953,435
243C 3,953,436
3,953,437
3,953,438
3,953,439
3,953,440
247.5FP 3,953,442
248A 3,953,443
250AC 3,953,444
250A 3,953,445
251QB 3,953,446
256.4C 3,953,447
268BZ 3,953,448
268PH 3,953,449
270K 3,953,450
281NH 3,953,451
282 3,953,452
284 3,953,453
285.5 3,953,454
286A 3,953,455
288CF 3,953,457
288GF 3,953,458
288R 3,953,456
293.54 3,953,441
293.89 3,953,459
294.8C 3,953,461
294.8G 3,953,460
295A 3,953,462
295R 3,953,463
302F 3,953,464
307R 3,953,465
308D 3,953,466
310R 3,953,467
332.2R 3,953,468
333 3,953,469
340.5 3,953,470
340.9 3,953,471
343 3,953,472
343.3R 3,953,473
345.7 3,953,474
346.8R 3,953,475
347.2 3,953,476
347.3 3,953,477
347.4 3,953,478
348A 3,953,479
348.5L 3,953,480
350R 3,953,481
396R 3,953,482
397.3 3,953,483
419 3,953,484
428 3,953,485
435 3,953,486
448.2E 3,953,487
454 3,953,488
455R 3,953,489
465D 3,953,491
465E 3,953,492
3,953,493
465F 3,953,490
468D 3,953,495
468R 3,953,494
471R 3,953,496
3,953,497
475FR 3,953,498
514 3,953,499
517 3,953,500
518 3,953,501
520D 3,953,502
534S 3,953,503
536 3,953,504
553A 3,953,506
553R 3,953,505
559B 3,953,507
580 3,953,509
3,953,510
583K 3,953,511
584R 3,953,512
585C 3,953,513
586C 3,953,514
586R 3,953,515
3,953,516
593R 3,953,517
3,953,518
609D 3,953,519
609E 3,953,520
610B 3,953,521
611B 3,953,522
3,953,523
617A 3,953,524
618R 3,953,525
621A 3,953,528
621G 3,953,527
621H 3,953,526
621R 3,953,529
623R 3,953,530
625 3,953,531
632R 3,953,532
641 3,953,533
662 3,953,508
666PY 3,953,534
668A 3,953,536
668B 3,953,535
676R 3,953,537
683.48 3,953,538
836 3,953,408
860 3,953,539
878R 3,953,540
3,953,541
3,953,542
880B 3,953,543
898 3,953,545
938 3,953,546

CLASS 261

18A 3,953,547
50A 3,953,548
3,953,549
64R 3,953,550
91 3,953,551
93 3,953,552
122 3,953,553
124 3,953,554
3,953,555

CLASS 264

.5 3,953,556
22 3,953,557
3,953,558
39 3,953,559
50 3,953,560
57 3,953,561
63 3,953,562
66 3,953,563
78 3,953,564
210F 3,953,565
288 3,953,566

CLASS 266

50 3,953,005
193 3,953,007
3,953,008
283 3,953,009

CLASS 267

34 3,953,010
48 3,953,011
154 3,953,012

CLASS 269

7 3,953,013
43 3,953,014
46 3,953,015
236 3,953,016

CLASS 270

54 3,953,017
55 3,953,018
61F 3,953,019

CLASS 271

3.1 3,953,021
14 3,953,020
95 3,953,022
173 3,953,023

CLASS 272

1E 3,953,024
132 3,953,025
140 3,953,026

CLASS 273

1R 3,953,027
26EA 3,953,028
95A 3,953,029
95R 3,953,030
104 3,953,031
135R 3,953,032
183E 3,953,033
186C 3,953,034
192 3,953,035

CLASS 274

9R 3,953,036

CLASS 277

30 3,953,037
93R 3,953,038

CLASS 279

1TS 3,953,039

CLASS 280

6H 3,953,040
11.26 3,953,041
11.37E 3,953,043
33.99H 3,953,044
47.3 3,953,048
154.5R 3,953,053
179R Re.28,788
242WC 3,953,054
504 3,953,055
631 3,953,042
638 3,953,045
639 3,953,047
644 3,953,046
730 3,953,049
760 3,953,050
763 3,953,051
3,953,052

CLASS 281

29 3,953,056

CLASS 285

67 3,953,057
110 3,953,058
192 3,953,059
272 3,953,060

CLASS 292

5 3,953,061
57 3,953,062
144 3,953,063
187 3,953,064

CLASS 294

1R 3,953,065

CLASS 296

23R 3,953,066
137A 3,953,067

CLASS 297

216 3,953,068
367 3,953,069
389 3,953,070
454 3,953,071
460 3,953,072

CLASS 299

5 3,953,073

CLASS 301

5BA 3,953,074
40S 3,953,075

CLASS 302

2R 3,953,076
21 3,953,077
27 3,953,078

CLASS 303

7 3,953,079
21BE 3,953,080
21CH 3,953,081
21A 3,953,082
21P 3,953,083
24R 3,953,084

CLASS 305

16 3,953,085

CLASS 307

10R 3,953,740
87 3,953,741
95 3,953,742
205 3,953,743
208 3,953,744
221C 3,953,745
247R 3,953,746
253 3,953,747
3,953,748
277 3,953,749

CLASS 308

3A 3,953,086
22 3,953,087
147 3,953,088
237R 3,953,089

CLASS 310

25 3,953,754
91 3,953,751
154 3,953,750
156 3,953,752
168 3,953,753

CLASS 312

183 3,953,090
223 3,953,091
233 3,953,092
245 3,953,093
303 3,953,094

CLASS 313

174 3,953,755
220 3,953,756
222 3,953,757
360 3,953,758

CLASS 315

3.5 3,953,759
13C 3,953,760
71 3,953,761
169TV 3,953,762
262 3,953,763
386 3,953,764
389 3,953,765

CLASS 317

18D 3,953,766
3,953,767
31 3,953,768
134 3,953,769
146 3,953,770
248 3,953,771
262A 3,953,772

CLASS 318

52 3,953,773
147 3,953,775
312 3,953,776
474 3,953,777
594 3,953,774
683 3,953,778

CLASS 321

2 3,953,779
18 3,953,780
27R 3,953,781
28 3,953,782
43 3,953,783
3,953,785
45C 3,953,784
3,953,786

CLASS 322

13 3,953,787

CLASS 323

25 3,953,788

CLASS 324

.5AC 3,953,789
30B 3,953,790
34R 3,953,791
61R 3,953,792
76A 3,953,793
83D 3,953,794
142 3,953,795
158F 3,953,797
158R 3,953,796

CLASS 325

30 3,953,798
376 3,953,799
455 3,953,800
464 3,953,801
474 3,953,802

CLASS 328

112 3,953,803
130 3,953,804
162 3,953,805

CLASS 330

2 3,953,806
35 3,953,807
3,953,808

CLASS 331

94.5H 3,953,809

CLASS 332

7.51 3,953,810

CLASS 335

16 3,953,811
23 3,953,812
112 3,953,813
230 3,953,814

CLASS 336

90 3,953,815
119 3,953,816

CLASS 337

136 3,953,817
191 3,953,818

CLASS 338

36 3,953,819
89 3,953,820
174 3,953,821

CLASS 339

6R 3,953,095
17L 3,953,096
37 3,953,097
45R 3,953,098
60M 3,953,099
112R 3,953,100
174 3,953,101
258R 3,953,102
276T 3,953,103

CLASS 340

1R 3,953,822
3,953,823
3C 3,953,824
5MP 3,953,825
7PC 3,953,826
7R 3,953,827
9 3,953,828
17R 3,953,829
52R 3,953,830
53 3,953,831
171R 3,953,832
172.5 3,953,833
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173MS 3,953,836
173R 3,953,837
3,953,838
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174EB 3,953,840
174TF 3,953,841
3,953,842
224 3,953,843
237S 3,953,844
244B 3,953,845
337 3,953,846
347AD 3,953,847
409 3,953,848

CLASS 343

7A 3,953,849
17.7 3,953,850
18E 3,953,851
100SA 3,953,852
3,953,853
106D 3,953,854
106R 3,953,855
112D 3,953,856
705 3,953,857
779 3,953,858

CLASS 346

1 3,953,859
75 3,953,860
139C 3,953,861
140R 3,953,862

CLASS 350

4 3,953,104
7 3,953,105
16 3,953,106
149 3,953,107
150 3,953,108
160R 3,953,109
161 3,953,110
189 3,953,111
227 3,953,112
288 3,953,113

CLASS 351

123 3,953,114
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141 3,953,116

CLASS 353

11 3,953,117
19 3,953,118
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119 3,953,120

CLASS 354

25 3,953,863
27 3,953,864
29 3,953,865
51 3,953,867
109 3,953,868
115 3,953,869
252 3,953,871
275 3,953,872
277 3,953,870
315 3,953,873

CLASS 355

3DD 3,953,121
12 3,953,122
45 3,953,123
75 3,953,124
83 3,953,125

CLASS 356

28 3,953,126
103 3,953,127
106R 3,953,128
109 3,953,129
125 3,953,130
141 3,953,131
152 3,953,132
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155 3,953,134
175 3,953,135
181 3,953,136
222 3,953,137

CLASS 357

8 3,953,874
22 3,953,879
30 3,953,880
44 3,953,866
51 3,953,875
60 3,953,876
72 3,953,877
81 3,953,878

CLASS 358

4 3,953,881
27 3,953,883
30 3,953,884
54 3,953,885
56 3,953,886
800 3,953,882

CLASS 360

2 3,953,887
46 3,953,888
77 3,953,889
85 3,953,890
105 3,953,891

CLASS 403

75 3,953,138
140 3,953,139
258 3,953,140
259 3,953,141
371 3,953,142
374 3,953,143
3,953,144

CLASS 404

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CLASS 415

121B 3,953,146
143 3,953,147
199R 3,953,148

CLASS 416

136 3,953,149
183 3,953,151
184 3,953,150

CLASS 417

45 3,953,152
204 3,953,153
270 3,953,154
554 3,953,155

CLASS 418

35 3,953,156
36 3,953,157
61B 3,953,158
61R 3,953,159
190 3,953,160

CLASS 423

2 3,953,567
7 3,953,568
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155 3,953,570
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158 3,953,572
161 3,953,573
178 3,953,574
212 3,953,575
213.7 3,953,576
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263 3,953,579
283 3,953,580
321S 3,953,581
410 3,953,582
450 3,953,583
462 3,953,584
489 3,953,585
575 3,953,586
576 3,953,587

CLASS 424

12 3,953,588
60 3,953,589
65 3,953,590
80 3,953,591
89 3,953,592
114 3,953,593
117 3,953,594
230 3,953,595
248 3,953,596
253 3,953,597
258 3,953,598
265 3,953,599
273 3,953,600
275 3,953,601

283	3,953,602	93	3,953,611		3,953,622	131	3,953,633	332	3,953,646	518	3,953,660
	3,953,603	104	3,953,612	189	3,953,623	133	3,953,634	378	3,953,647	539	3,953,656
	3,953,604	502	3,953,613	256	3,953,624	151	3,953,635		3,953,648	542	3,953,661
311	3,953,605	536	3,953,614	258	3,953,625	154	3,953,638	383	3,953,649		
322	3,953,606	594	3,953,615	346	3,953,626	155	3,953,636	389	3,953,650	CLASS 526	
341	3,953,607	637	3,953,616	427	3,953,627	156	3,953,637	391	3,953,651	22	3,953,407
361	3,953,608			442	3,953,628	160	3,953,639	406	3,953,657	82	3,953,409
		CLASS 427				188	3,953,640	412	3,953,652	247	3,953,412
CLASS 425		6	3,953,617	CLASS 428		195	3,953,641	419	3,953,653	284	3,953,410
66	3,953,161	21	3,953,618	36	3,953,629	204	3,953,642	458	3,953,658	304	3,953,544
		39	3,953,619	38	3,953,630	220	3,953,643	471	3,953,654	348	3,953,414
CLASS 426		53	3,953,620	95	3,953,631		3,953,644	474	3,953,655	350	3,953,413
2	3,953,609	54	3,953,621		3,953,632	310	3,953,645	511	3,953,659		
39	3,953,610										

CLASSIFICATION OF DESIGNS

D2—	25	239,667		239,680	D8—	90	239,694		107 239,709		239,719	D55—	1C	239,731
	33C	239,669	175	239,685		109	239,693		111 239,708		239,721	D56—	4B	239,732
	381	239,668	177	239,670	D9—	37	239,697		191 239,705	R	239,720			239,733
D6—	15	239,676		239,672		167	239,698	D13—	1B 239,701	14J	239,722			239,734
	18	239,681		239,684		186	239,696		G 239,702	D27—	8 239,723	D57—	1F	239,735
	27	239,675	182	239,677			239,699	D19—	76 239,700	D30—	16 239,724	D61—	T	239,736
	47	239,671	D7—	1 239,686		237	239,695	D22—	28 239,712	D34—	5CB 239,726	D83—	N	239,737
	49	239,683	46	239,688	D10—	14	239,703	D23—	11 239,713		GS 239,725			239,738
	85	239,674		239,689		73	239,704		69 239,714		41 239,727	D86—	R	239,739
		239,678	65	239,687		106	239,706		71 239,715	D47—	6E 239,728	D87—	2	239,740
		239,682	128	239,690	D12—	56	239,707	D26—	1D 239,717	D48—	23R 239,729		3F	239,741
	146	239,673	130	239,691		64	239,711		R 239,716		24 239,730	D95—	A	239,742
	161	239,679		239,692		73	239,710		5C 239,718					

CLASSIFICATION OF PLANTS

P. — 68 3,871	P. — 3,872	P. — 3,873	P. — 3,874	P. — 3,875

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1	:	3,952,590	3,952,543	3,953,094		3,953,866	3,952,636	3,952,573
		3,952,627	3,952,562	3,953,104		3,953,889	3,952,644	3,952,578
		3,952,980	3,952,565	3,953,113	8	: 3,952,439	3,952,681	3,952,580
		3,953,002	3,952,575	3,953,138		3,952,564	3,952,693	3,952,581
		3,953,092	3,952,582	3,953,144		3,952,592	3,952,720	3,952,604
		3,953,256	3,952,618	3,953,192		3,952,594	3,952,847	3,952,606
		3,953,257	3,952,623	3,953,208		3,952,620	3,952,903	3,952,609
		3,953,258	3,952,640	3,953,214		3,952,801	3,952,920	3,952,625
		3,953,259	3,952,647	3,953,260		3,952,802	3,952,965	3,952,629
		3,953,261	3,952,649	3,953,268		3,952,919	3,953,070	3,952,630
		3,953,262	3,952,653	3,953,279		3,952,992	3,953,091	3,952,641
		3,953,824	3,952,658	3,953,294		3,953,073	3,953,125	3,952,642
4	:	3,952,403	3,952,664	3,953,295	9	: 3,952,413	3,953,205	3,952,671
		3,952,405	3,952,680	3,953,309		3,952,446	3,953,255	3,952,677
		3,952,412	3,952,698	3,953,327		3,952,598	3,953,316	3,952,697
		3,952,461	3,952,702	3,953,338		3,952,601	3,953,609	3,952,727
		3,952,566	3,952,706	3,953,353		3,952,611	3,953,645	3,952,729
		3,952,767	3,952,722	3,953,364		3,952,659	3,953,667	3,952,753
		3,952,858	3,952,725	3,953,400		3,952,711	3,953,706	3,952,810
		3,952,958	3,952,730	3,953,406		3,952,877	3,953,726	3,952,825
		3,953,217	3,952,732	3,953,444		3,952,884	3,953,821	3,952,906
		3,953,746	3,952,751	3,953,477		3,952,912	3,953,828	3,952,911
		3,953,794	3,952,756	3,953,478		3,952,916	13 : 3,952,448	3,952,913
		3,953,875	3,952,766	3,953,507		3,953,098	3,952,472	3,952,937
5	:	3,952,704	3,952,798	3,953,532		3,953,105	3,952,533	3,952,961
		3,953,847	3,952,800	3,953,544		3,953,234	3,953,051	3,952,969
6	:	3,952,334	3,952,812	3,953,551		3,953,249	3,953,114	3,952,975
		3,952,337	3,952,830	3,953,618		3,953,362	3,953,178	3,952,987
		3,952,338	3,952,832	3,953,634		3,953,466	3,953,283	3,952,997
		3,952,340	3,952,878	3,953,646		3,953,510	3,953,615	3,953,011
		3,952,345	3,952,880	3,953,670		3,953,595	3,953,631	3,953,027
		3,952,352	3,952,888	3,953,679		3,953,616	3,953,685	3,953,040
		3,952,354	3,952,894	3,953,682		3,953,637	3,953,869	3,953,041
		3,952,356	3,952,899	3,953,683		3,953,647	15 : 3,953,186	3,953,061
		3,952,359	3,952,902	3,953,688		3,953,766	16 : 3,952,522	3,953,075
		3,952,374	3,952,908	3,953,689		3,953,812	3,952,819	3,953,082
		3,952,389	3,952,914	3,953,697	10	: Re.28,789	17 : Re.28,787	3,953,085
		3,952,394	3,952,917	3,953,708		3,953,346	Re.28,788	3,953,099
		3,952,396	3,952,979	3,953,734		3,953,386	3,952,432	3,953,101
		3,952,400	3,952,981	3,953,768		3,953,561	3,952,433	3,953,118
		3,952,410	3,952,999	3,953,769		3,953,566	3,952,436	3,953,120
		3,952,414	3,953,014	3,953,788		3,953,596	3,952,449	3,953,123
		3,952,415	3,953,025	3,953,825	11	: 3,952,998	3,952,452	3,953,134
		3,952,419	3,953,029	3,953,831	12	: 3,952,351	3,952,478	3,953,153
		3,952,442	3,953,032	3,953,833		3,952,422	3,952,510	3,953,175
		3,952,457	3,953,044	3,953,838		3,952,484	3,952,514	3,953,213
		3,952,474	3,953,062	3,953,840		3,952,485	3,952,515	3,953,237
		3,952,505	3,953,066	3,953,841		3,952,488	3,952,516	3,953,276
		3,952,519	3,953,072	3,953,842		3,952,524	3,952,530	3,953,277
		3,952,526	3,953,076	3,953,844		3,952,528	3,952,536	3,953,297
		3,952,527	3,953,086	3,953,856		3,952,532	3,952,545	3,953,305

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42 : Re.28,790
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3,953,785
3,953,805
3,953,834
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3,953,849
3,953,891

49 : 3,952,506	3,952,764	3,952,678	3,953,129	3,952,622	3,953,035
3,953,572	3,952,935	3,952,757	3,953,287	3,952,712	3,953,311
3,953,574	3,952,971	3,952,769	3,953,642	3,952,718	3,953,329
50 : 3,953,265	3,953,128	3,952,871	3,953,700	3,952,739	3,953,553
51 : 3,952,521	3,953,355	3,952,973	3,953,731	3,952,744	3,953,680
3,952,529	3,953,713	3,952,974	54 : 3,952,982	3,952,837	3,953,742
3,952,559	3,953,855	3,953,127	55 : 3,952,480	3,952,838	3,953,776
3,952,628	53 : 3,952,401				

Design Patents

6 : 239,668	239,738	13 : 239,730	239,725	36 : 239,669	44 : 239,691
239,683	9 : 239,696	17 : 239,679	239,729	239,676	239,692
239,701	239,699	239,680	25 : 239,667	239,698	239,700
239,703	239,708	239,685	239,718	239,702	48 : 239,678
239,706	12 : 239,675	239,695	239,735	239,713	239,690
239,707	239,697	239,704	26 : 239,711	239,736	239,710
239,715	239,709	239,722	239,731	239,740	51 : 239,677
239,719	239,714	239,741	27 : 239,705	37 : 239,684	55 : 239,688
239,720	239,721	18 : 239,681	29 : 239,717	40 : 239,682	239,689
8 : 239,693	239,726	20 : 239,739	34 : 239,670	239,712	56 : 239,724
239,737	239,727	24 : 239,672	239,723	42 : 239,716	

Plant Patents

39 : 3,874	3,875				

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U.S. DEPARTMENT OF COMMERCE
Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, Commissioner